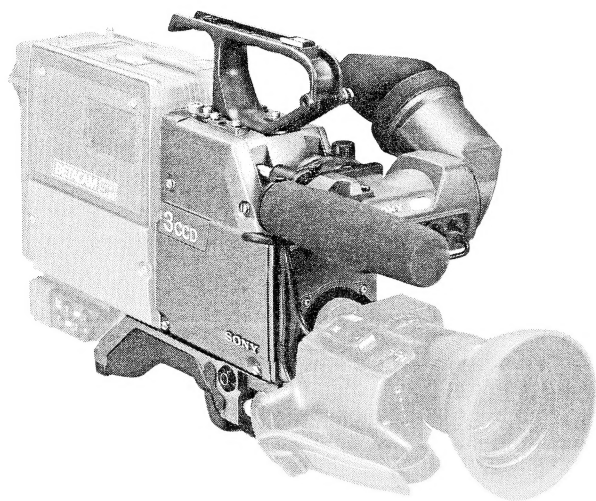


SONY®

COLOR VIDEO CAMERA

BVP-7



BETACAMTM

OPERATION MANUAL

1st Edition

Serial No. 10001 and Higher

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC rules.

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General

The BVP-7 is a compact and lightweight three-chip Charge Coupled Device (CCD) color video camera featuring newly designed Interline Transfer (IT) CCD image sensors. In addition, an electronic shutter, with selectable shutter speeds, has been added to make clearer shooting of moving objects and the use of strobe effects possible. The BVP-7's unique adaptability allows it to be combined with other equipment, such as a BVV-5/BVV-1A VCR for Betacam applications, a BVF-50, 5-inch studio viewfinder, or a CA-3A or CA-50 camera adaptor, for easy handling and portability in almost any situation. Furthermore, the BVP-7 can be controlled by a CCU-350 camera control unit when connected to it via a CA-50.

Features

Newly designed CCD image sensors

Thanks to the addition of the newly designed IT CCD image sensors, resolution and other characteristics have been improved.

Other outstanding advantages of video cameras which use CCDs include:

- Compact and lightweight, with low power consumption
- Very few after-images and high resistance to a burned-in image
- No scanning (geometric) distortion
- High resistance to vibration and mechanical shock
- Capable of shooting in strong magnetic fields
- Not necessary to adjust the registration
- Durable for long, trouble-free use

Electronic shutter

The electronic shutter is built into the imager and enables the BVP-7 to produce clear images even when the objects it is shooting are moving at very high speeds. The advantages of this function are most obvious during playback of still or slow-motion pictures.

Two-way ENG viewfinder adjustment

The ENG viewfinder can be adjusted by moving it left and right, and/or back and forth until the most convenient position is obtained.

Compact and lightweight

Because of the light and rigid magnesium die-cast body, the BVP-7 is easy to handle and operate.

High sensitivity

The gain of the video amplifier can be increased by 9 dB or 18 dB. Even at its highest setting, high quality output is assured and shooting under low light is possible.

The automatic black set/black balance and white balance adjustments

The BVP-7 comes with a factory-preset white balance value; 3200 K or 5600 K according to the selection of the built-in color temperature conversion filter. In addition, the BVP-7 can also memorize up to eight white balance values (two for each filter setting) for easy access in a variety of shooting conditions.

The black set and the black balance can also be automatically adjusted.

Warning indications during operation

The BVP-7 is equipped with on-screen cautions, viewfinder lamps and an audible alarm to warn the operator when a malfunction or a problem, such as a drop in battery voltage, occurs. When directly connected to a Betacam VCR, it will let you know when the end of a tape is approaching. When a BVV-5 or another Betacam VCR is directly attached, it will also display the amount of tape time remaining.

On-screen display function

The selector settings and the phases of the self-diagnosis test can be displayed on the viewfinder screen.

Automatic iris closing mechanism

The iris of the lens automatically closes under the following conditions:

- The CAMERA/VTR switch is set to the PREHEAT position.
- The OUTPUT/DCC selector is set to the BARS position in order to output color bars.
- An automatic black set/black balance adjustment is being performed.

SMPTE color bar signal generator

The SMPTE color bar signal generator is built into the video camera so that the controls on the connected video monitor can be set easily by referring to the color bars.

Others

- A wide dynamic range which will allow light with an intensity level up to six times greater than that of normal light, to be input by activating the Dynamic Contrast Control (DCC)
- A built-in sync generator, applicable to the RS170A standard
- Gen-lock is possible through an optional CA-3A or CA-50 camera adaptor
- Time code gen-lock is possible when using the video camera with a BVV-5
- An incorporated two-line image enhancer
- An incorporated shading corrector for use with a lens extender
- Improved color resolution with an R/G mixing detail circuit
- An incorporated saw-tooth waveform generator
- An incorporated I/Q encoder through which the standard signal is output
- An incorporated masking circuit
- A built-in sharp-directional microphone
- A video level indicator
- An audio channel which can be controlled by the video camera
- An incorporated zebra pattern generator
- Choice of microphones: either the supplied microphone or another can be used
- A high resolution viewfinder
- The viewfinder can be moved slightly to the left or right so that the screen can be seen with your left eye as well as with your right eye.

Precautions on operation

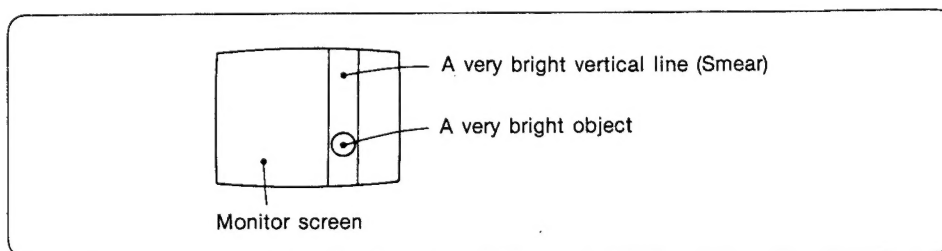
Precautions

- Handle the video camera gently. Do not drop it.
- Switch off all the units connected to the video camera when the video camera is not in use.
- Do not use or store the video camera in a very hot and/or humid location. The video camera should not be subjected to excessive dust and/or strong vibrations. (The operating temperature should be -20°C to $+45^{\circ}\text{C}$; -4°F to $+113^{\circ}\text{F}$.)
- Do not use any type of solvent, such as alcohol, benzine or thinner to clean the lens in the camera eyepiece. Clean it with a camera lens cleaner available at a camera shop.

Notes on CCD image sensors

Vertical smear

This may appear on the screen when an extremely bright object or spotlight such as an electric or fluorescent lamp, sunlight or reflected light is being shot. Note that this phenomenon is likely to occur when the electronic shutter is set to a faster position.



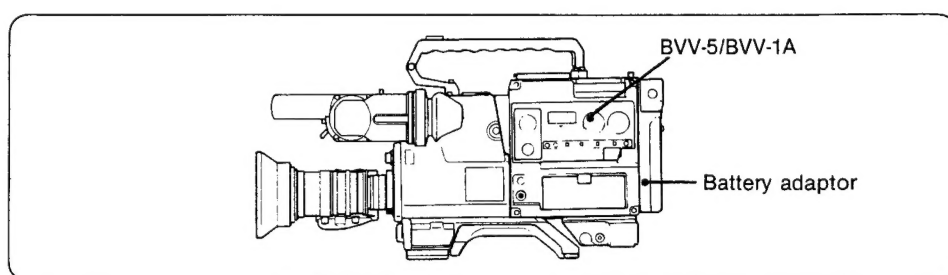
Wavy picture (Aliasing)

The images monitored on the screen may look wavy when fine stripes, straight lines or similar patterns are shot.

BVP-7 video camera system configuration

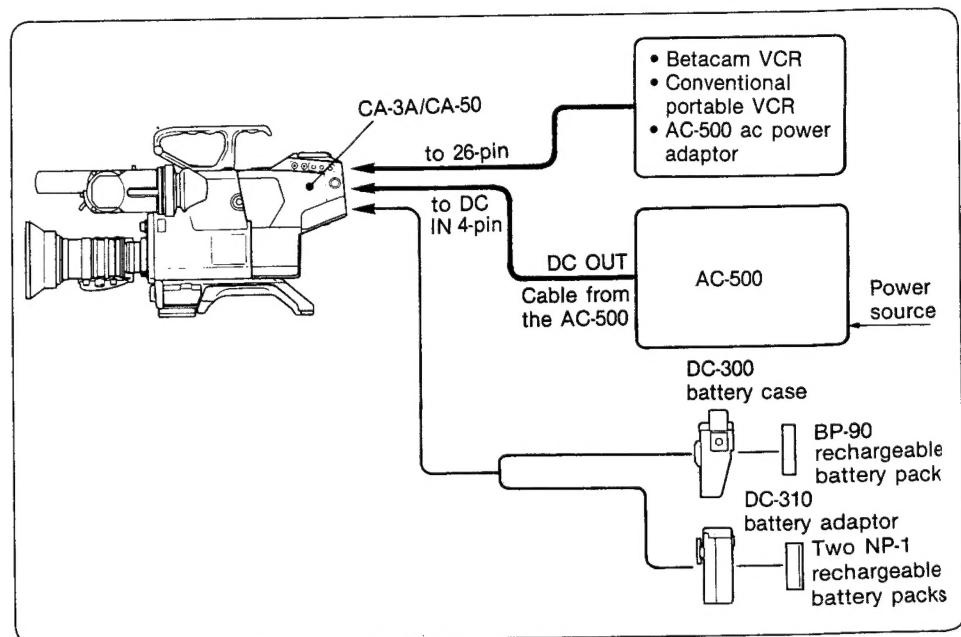
Power is supplied to the BVP-7 through the VTR connector (50-pin) located at the back of the BVP-7. When a Betacam VCR is to be directly attached, the power and signals are supplied from/to the VCR through the VTR connector. If you attach either a CA-3A or CA-50 camera adaptor (optional), the power and signals are fed through the VTR connector (26-pin) on the CA-3A or CA-50 from/to the connected VCR using a CCZ or CCZQ camera connection cable (optional). If you want to supply power only to the video camera via a CA-3A or CA-50 from an AC-500 ac power adaptor (optional), battery pack(s) (optional) or another compatible unit, use the DC IN connector (4-pin) located on the attached camera adaptor. If a CA-50 camera adaptor is attached, a CCU-350 camera control unit can be connected using a CCW-B or CCW camera connection cable so that the BVP-7 is controllable from the CCU-350.

Attaching a Betacam VCR



- Power is supplied to the video camera via the VTR connector (50-pin) from the VCR.

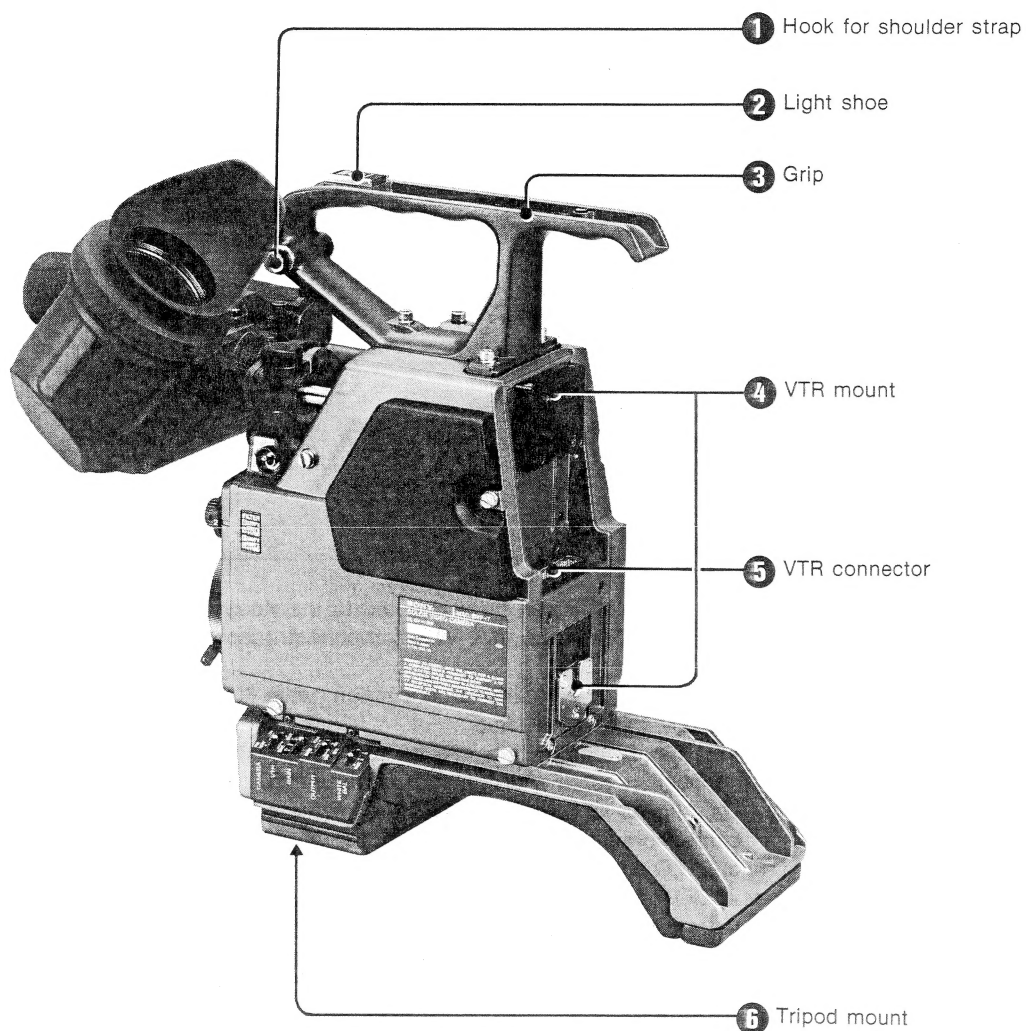
Attaching a camera adaptor



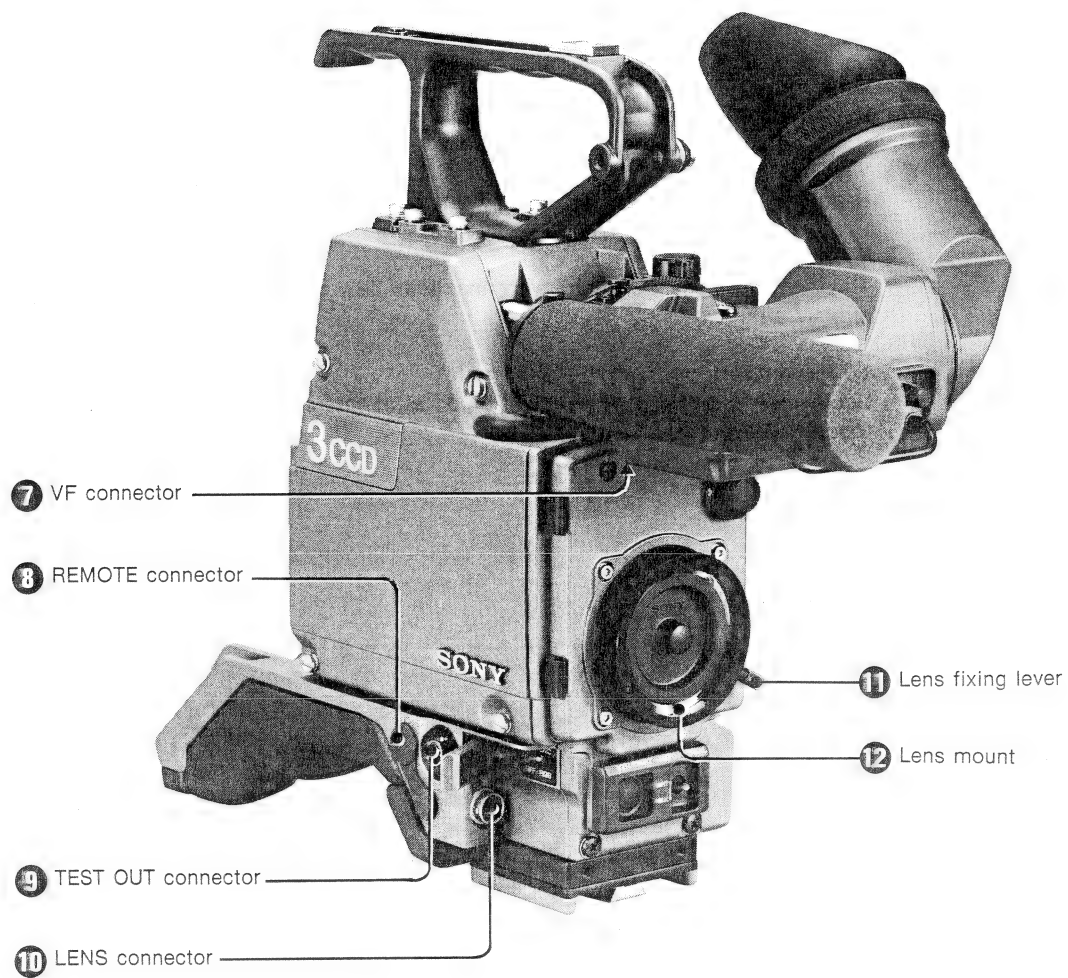
- A Betacam VCR can be connected to the video camera through a CCZ camera connection cable using a VTR component adaptor or VTR composite/component adaptor.
- The type of 25-pin camera connection cable (CCZ or CCZQ) to be used depends on the unit to be connected.
- Audio and video signals can be sent to the AC-500 through the CCZQ camera connection cable and output from the AC-500.
- Only power is supplied to the video camera from the AC-500 through the dc power cable. To send signals through to the AC-500, connect it to the video camera using a CCZQ camera connection cable.
- A BP-90 battery pack can be connected using the DC-300 battery case. Two NP-1 battery packs can also be connected using the DC-310 battery adaptor. See the manual supplied with the battery case/adaptor for instructions on how to attach the battery adaptor or the battery case.

Setting Up a BVP-7 Video Camera System

Location and function of mechanical parts and connectors



- 1 Hook for shoulder strap**
Used when attaching the supplied shoulder strap.
- 2 Light shoe**
Used when attaching an optional video light or an optional viewfinder.
- 3 Grip**
Used when carrying the video camera.
- 4 VTR mount**
Used when attaching a BVV-5, or a compatible Betacam VCR, or a camera adaptor.
- 5 VTR connector (50-pin)**
This connector makes electrical connections between the video camera and the unit directly attached.
- 6 Tripod mount**
Used when attaching the supplied tripod attachment so that the video camera can be mounted on a tripod.



7 VF (viewfinder) connector (20-pin)

This connector is to be connected to the supplied viewfinder or an optional viewfinder if it is attached.

8 REMOTE (remote control) connector (6-pin)

This connector is to be connected to an optional RM-P3 remote control unit if the video camera is to be remotely controlled with the RM-P3.

Note

A CA-3A camera adaptor also has a REMOTE connector. When it is attached to the video camera, use either the VCR's or the adaptor's connector, but not both at the same time, or you may damage the circuits in both units.

9 TEST OUT connector (BNC type)

This connector is to be connected to a video monitor or a VCR. A signal selected with the ENC/RGB selector is output. In order to output an encoded composite video signal, set the ENC/RGB selector to the ENC position and terminate the output signal with a 75-ohm load.

Note

In order to save power, the TEST OUT circuit inside the video camera will be cut off and no signal will be output if the TEST OUT connector is not terminated.

10 LENS connector (12-pin)

This connector is to be connected to a lens unit using the lens cable to control the function of the lens from the video camera.

11 Lens fixing lever

Used to fix a lens unit to the video camera.

12 Lens mount (special bayonet type)

Used to attach a lens unit to the video camera.

Attaching a Betacam VCR directly to the video camera

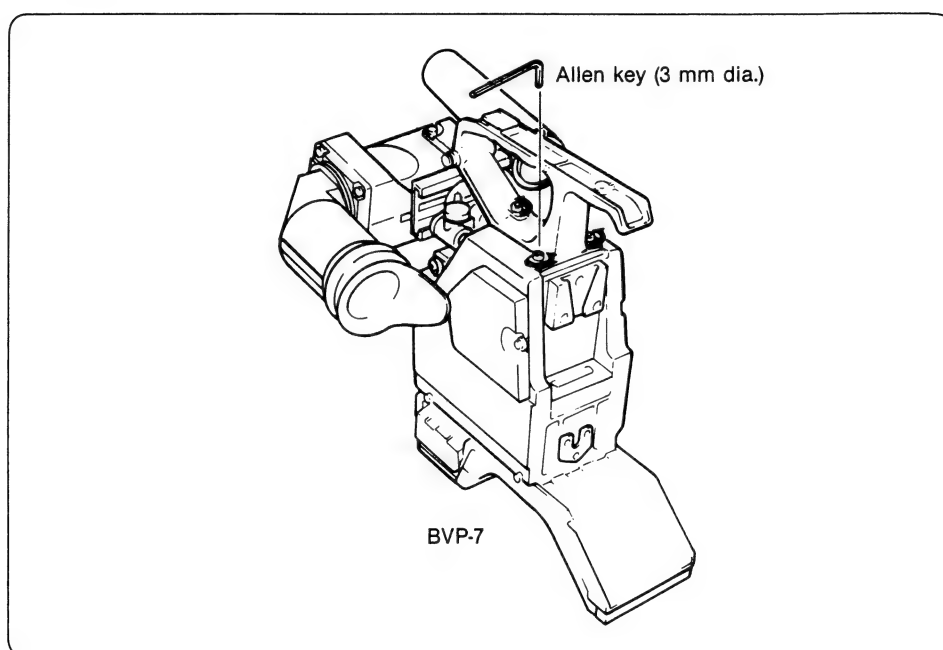
To take advantage of the Betacam's interactive capabilities when a BVV-5/BVV-1A Betacam VCR is attached directly to the BVP-7, follow the instructions below.

If you want to connect one of these VCRs or another kind of VCR/VTR using a camera connection cable, refer to the "Attaching a camera adaptor and connecting to a VCR" section of this manual on page 20. Note that when a Betacam VCR is attached directly to the BVP-7, either the VCR's or the camera's grip may be used. The unused grip should be removed and stored.

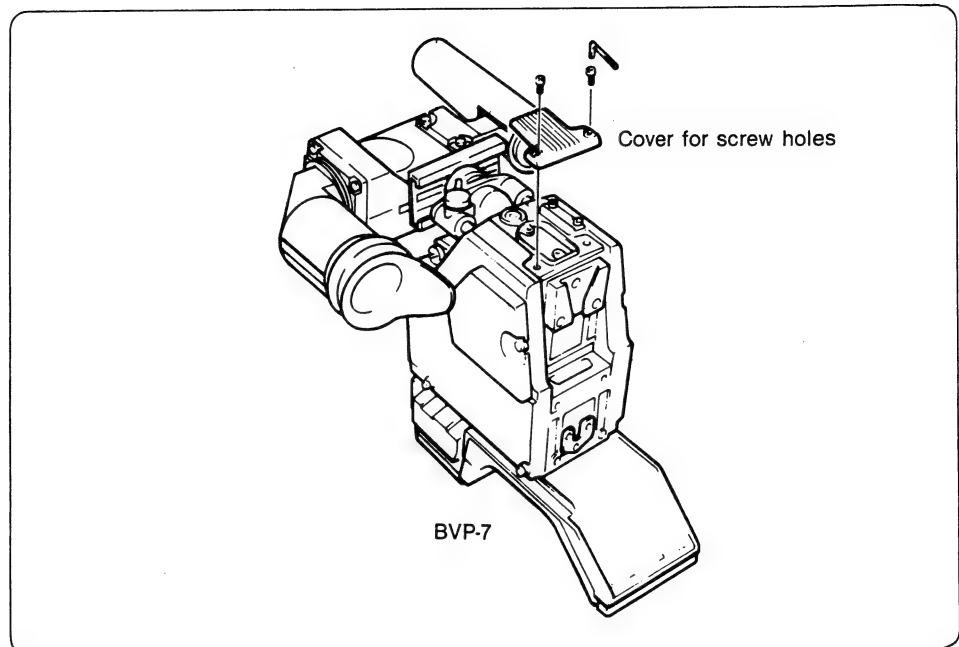
Using the grip of the VCR

Attaching a BVV-5 VCR

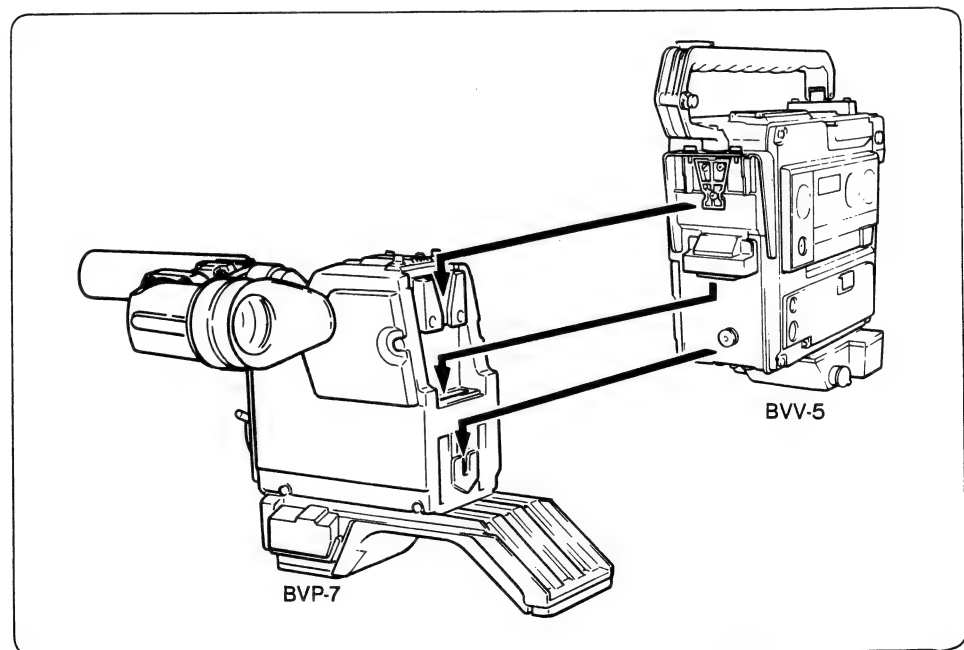
- 1 Remove the grip from the video camera.



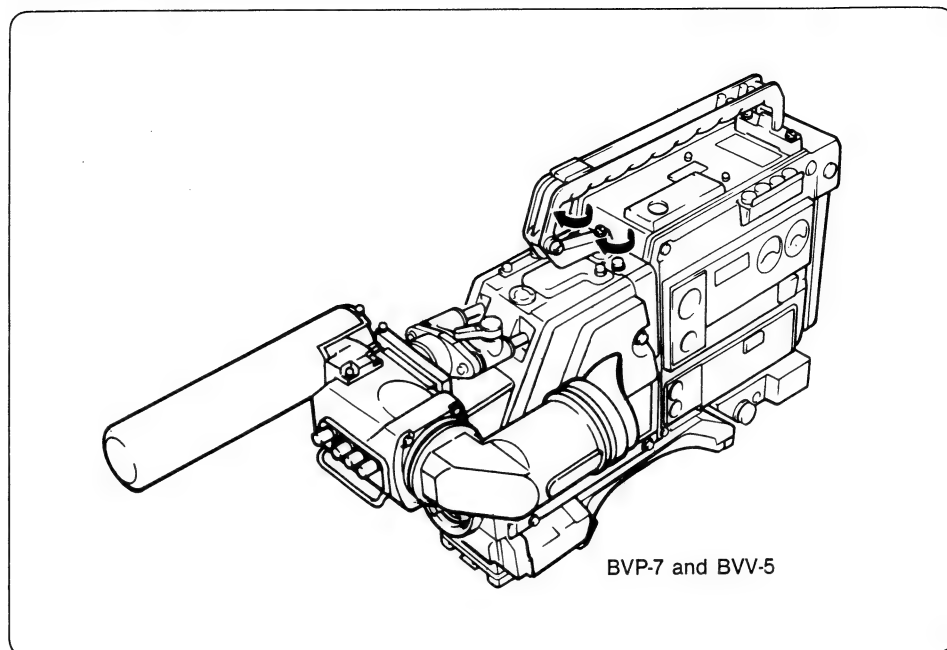
- 2** Attach the cover supplied with the video camera, to cover the screw holes.



- 3** Attach the VCR to the video camera.



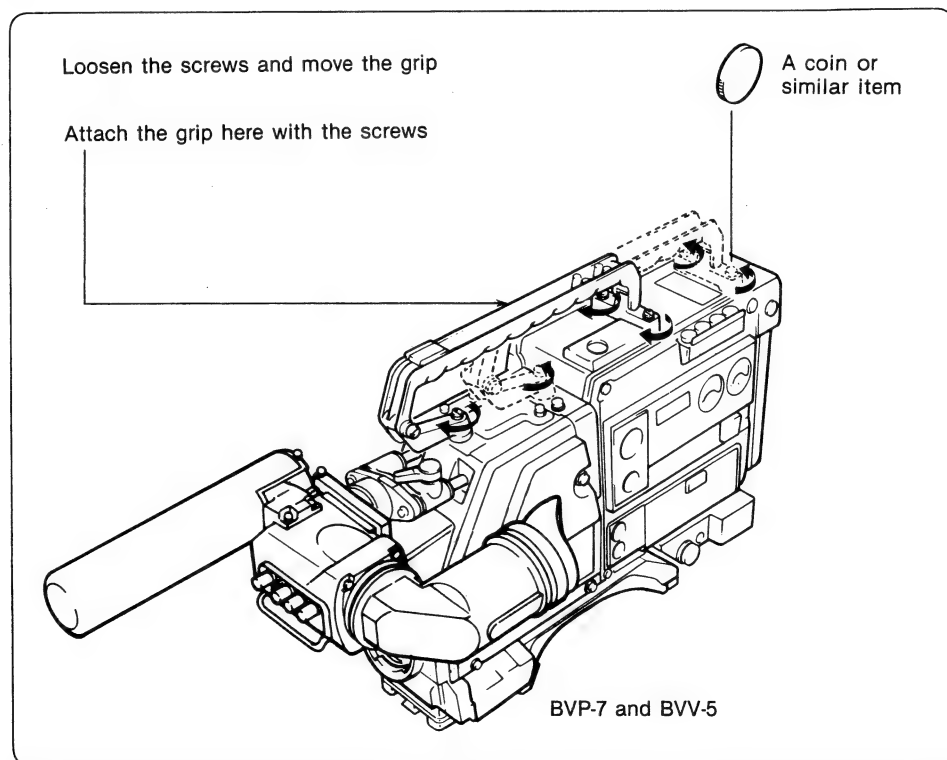
- 4** Tighten the two screws supplied with the VCR.



- 5** Screw the two M4 screws supplied with the VCR into the screw holes where the grip of the video camera was attached to protect the holes from dust and moisture.

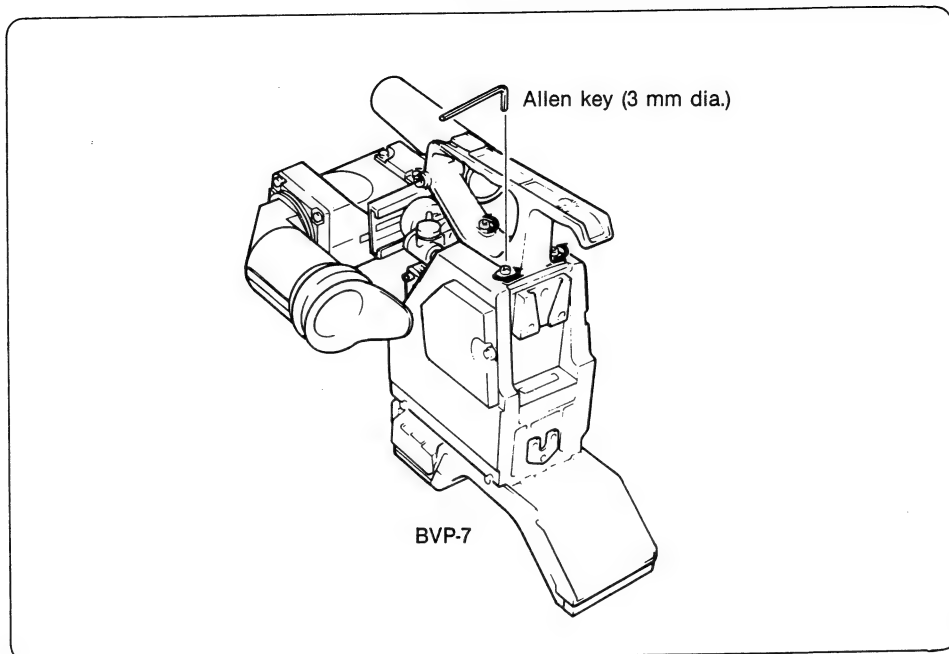
Repositioning the grip

Detach the grip of the VCR and attach it as illustrated below. Screw the two M4 screws supplied with the VCR into the screw holes where the grip of the VCR was attached.

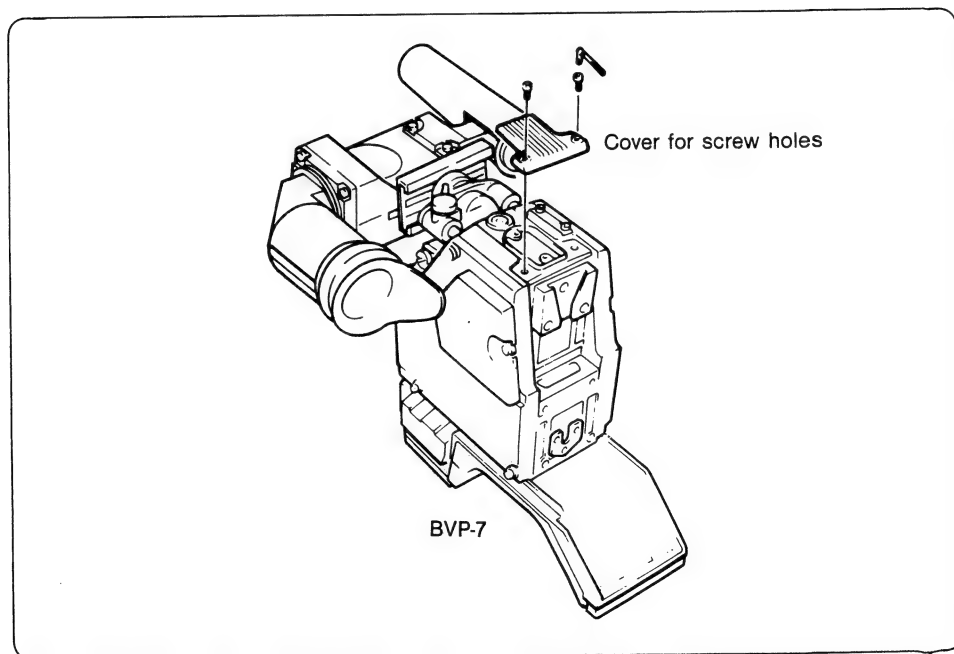


Attaching a BVV-1A VCR

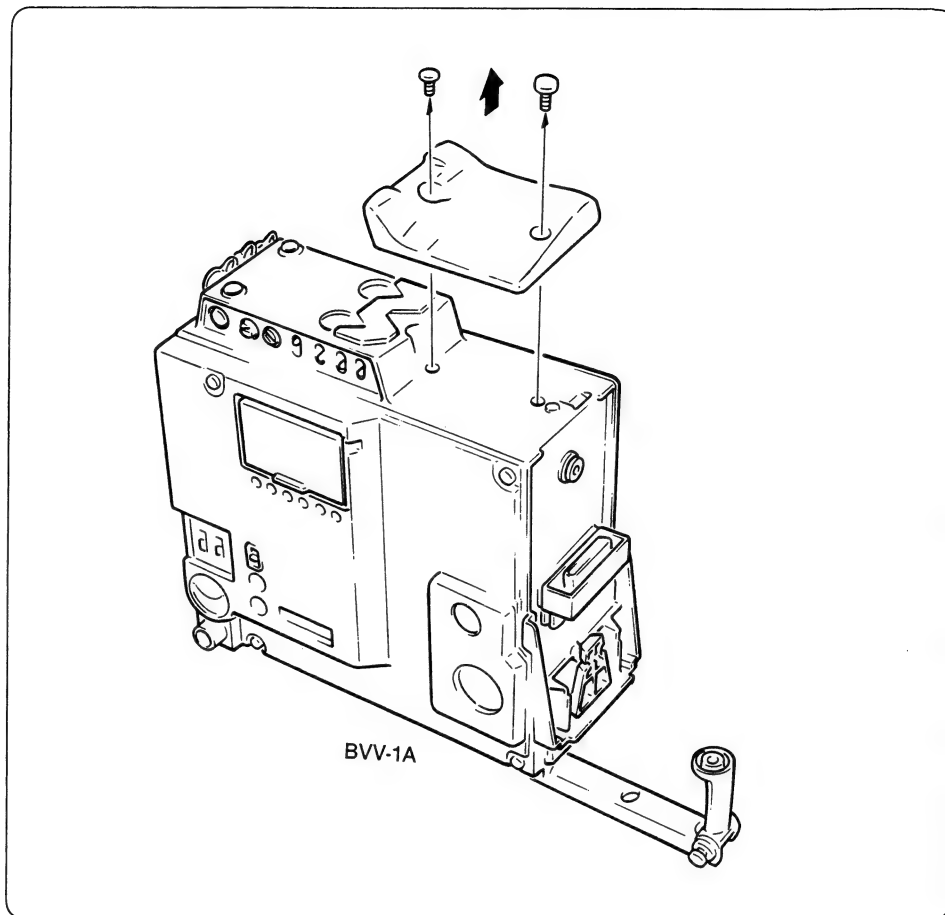
- 1 Remove the grip from the video camera.



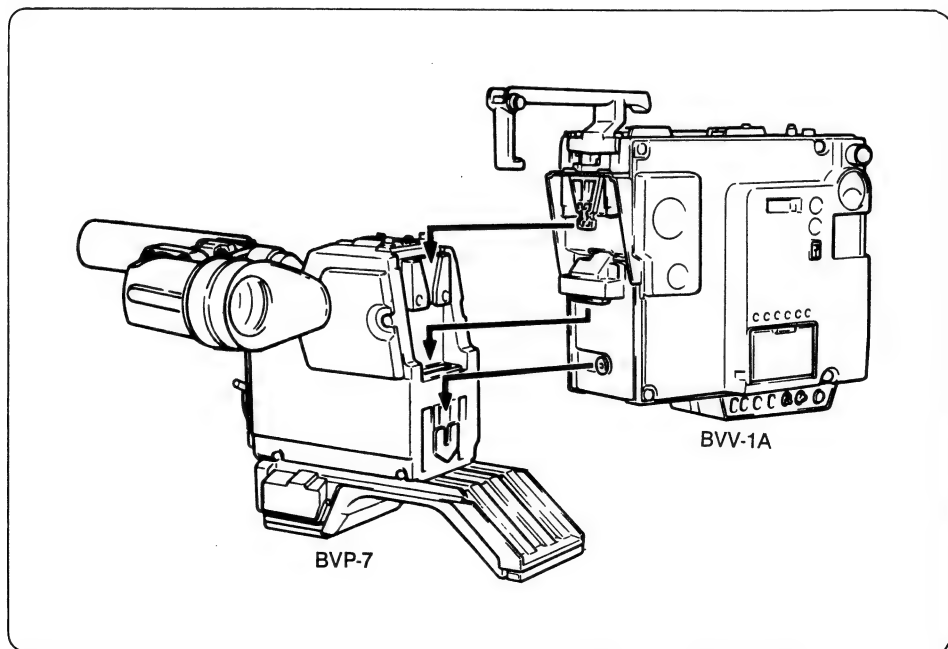
- 2 Attach the cover supplied with the video camera, to cover the screw holes.



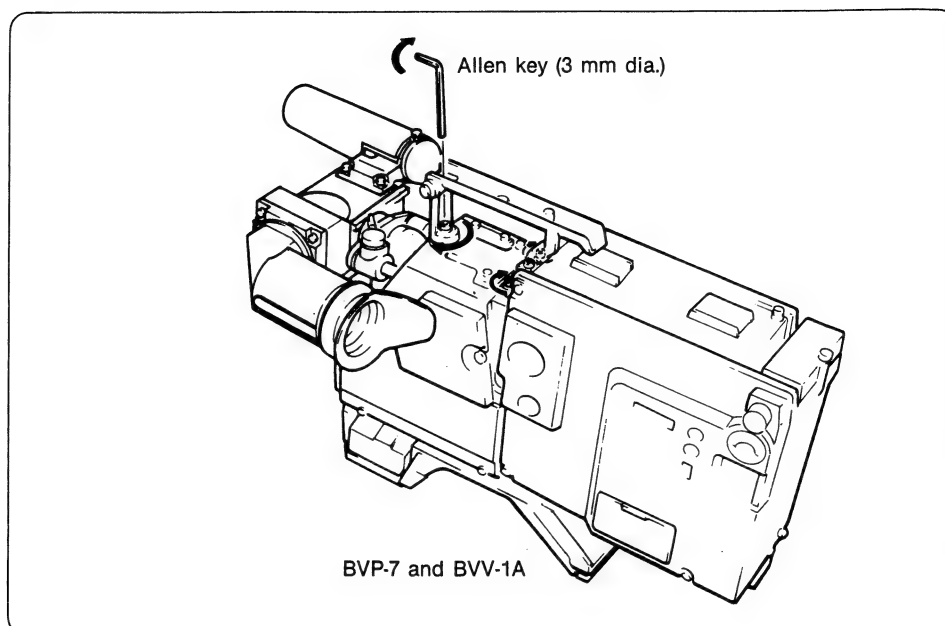
- 3** Remove the shoulder pad from the VCR.



- 4** Attach the VCR to the video camera.



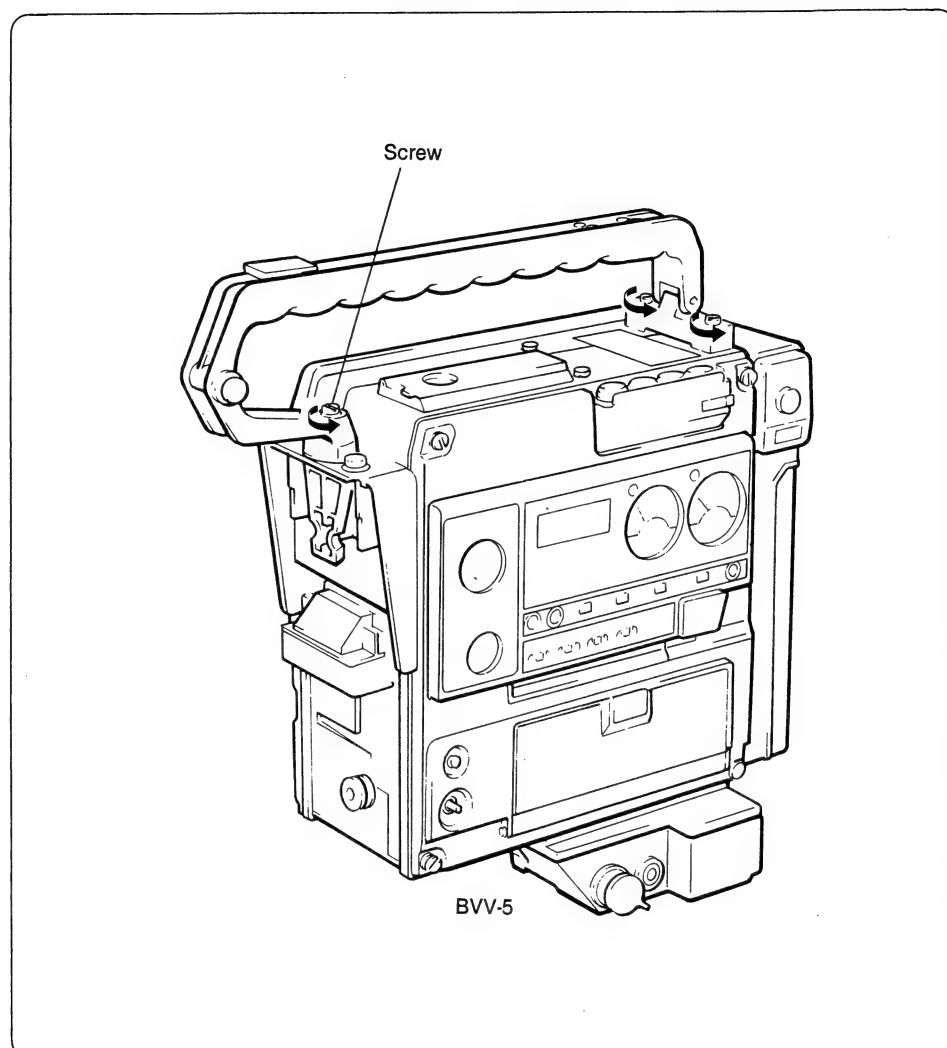
- 5** Tighten the three screws supplied with the VCR securely.



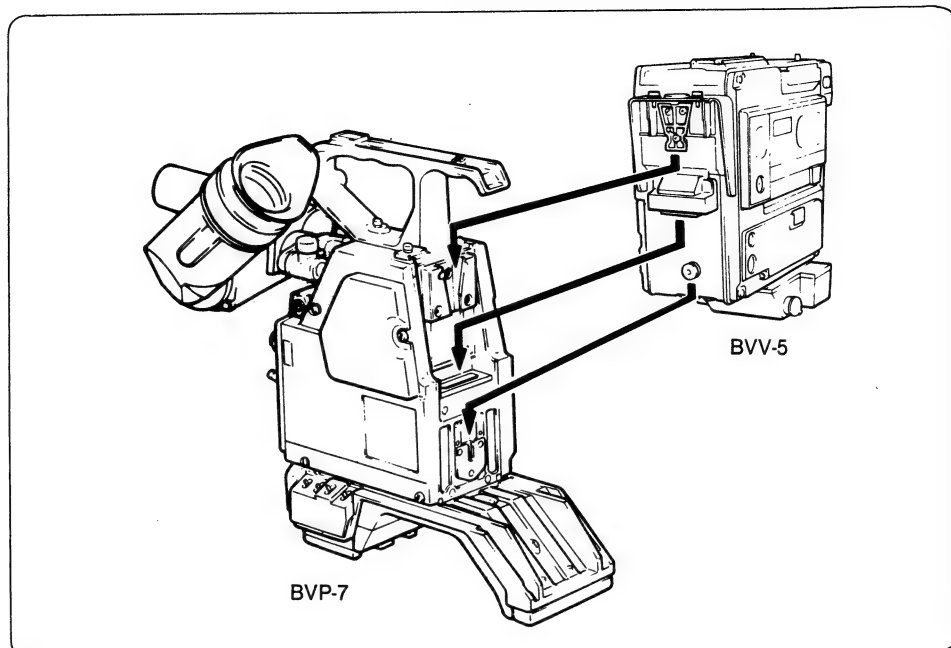
Using the grip of the video camera

Attaching a BVV-5 VCR.

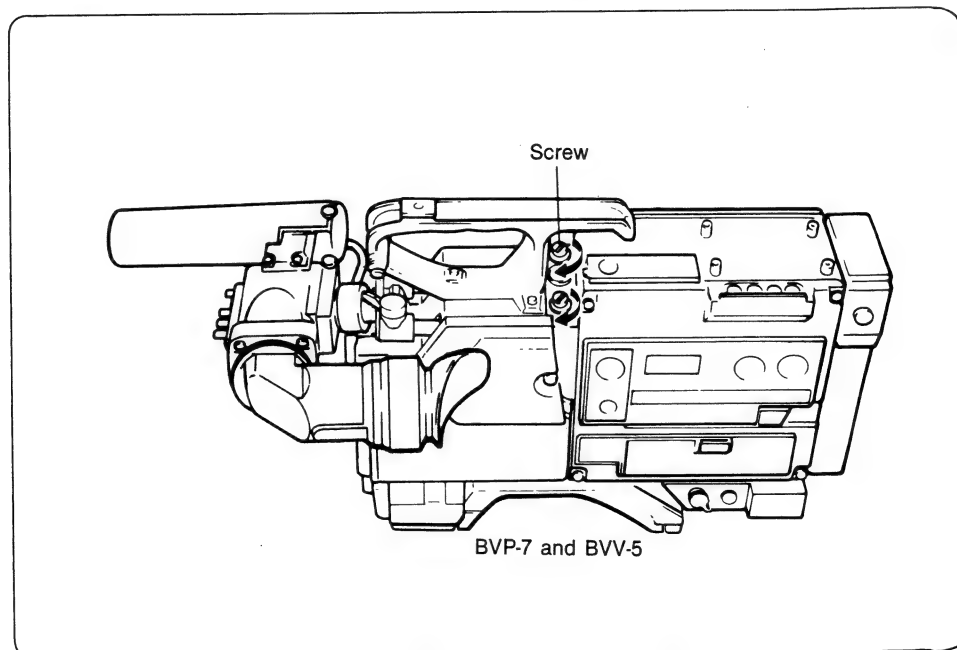
- 1 Remove the grip from the VCR.



- 2** Attach the VCR to the video camera.



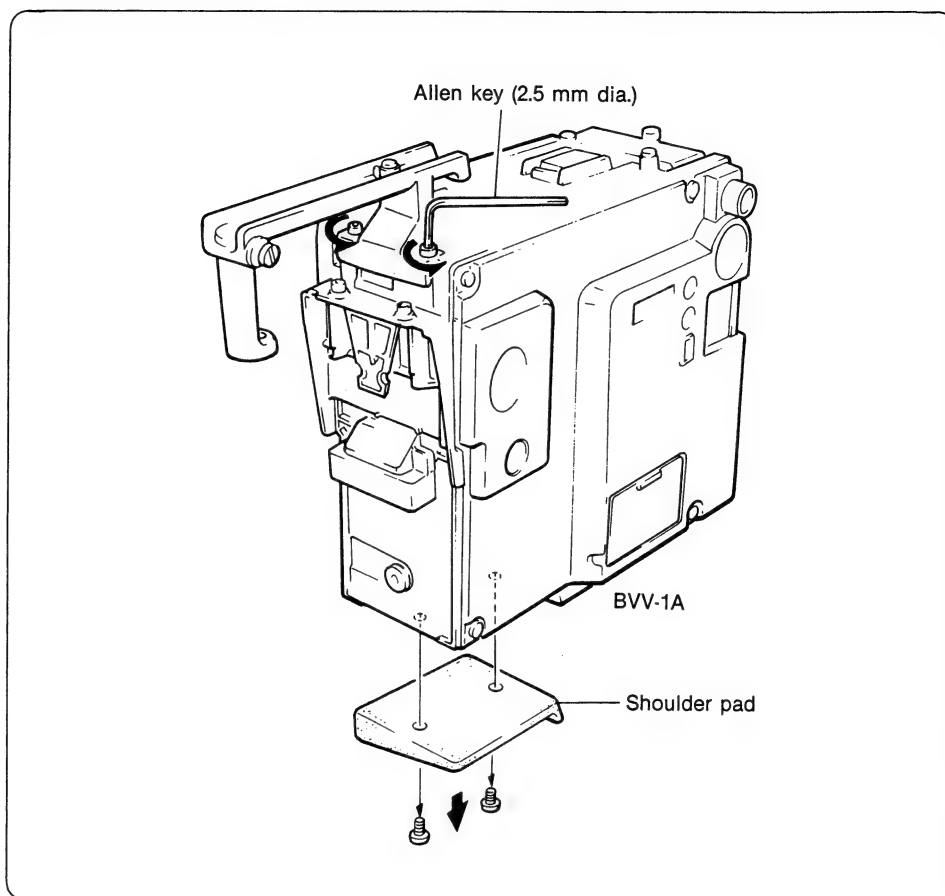
- 3** Tighten the two screws supplied with the VCR securely.



- 4** Cover the screw holes where the grip of the VCR was attached using the two M4 screws supplied with the VCR to protect the holes from dust and moisture.

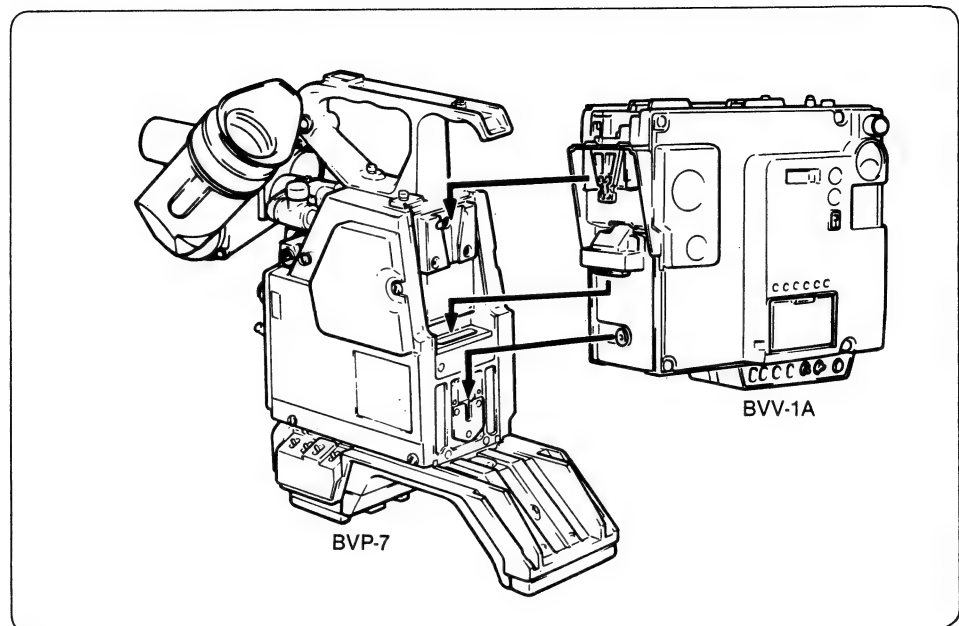
Attaching a BVV-1A VCR

- 1 Remove the grip and the shoulder pad from the VCR.

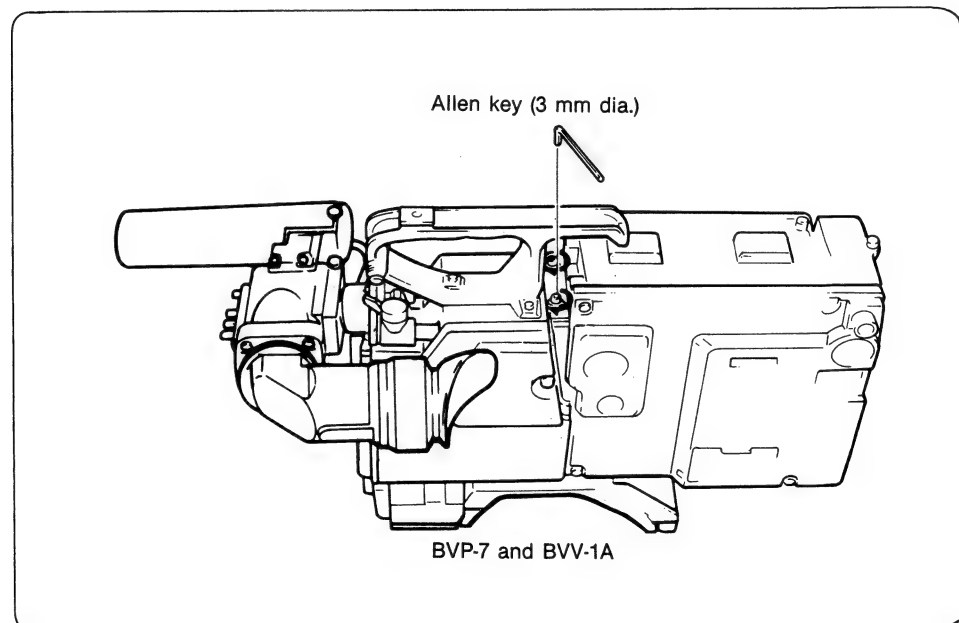


- 2 Attach the supplied screws to the screw holes where the grip of the VCR was attached.

- 3** Attach the VCR to the video camera.



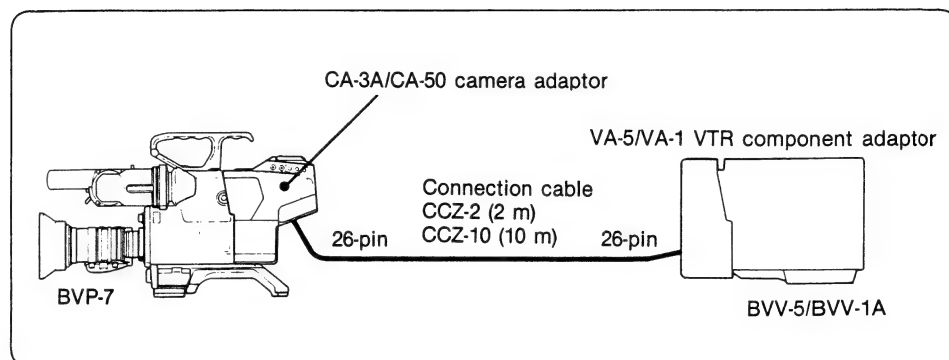
- 4** Tighten the two screws supplied with the VCR securely.



Attaching a camera adaptor and connecting to a VCR

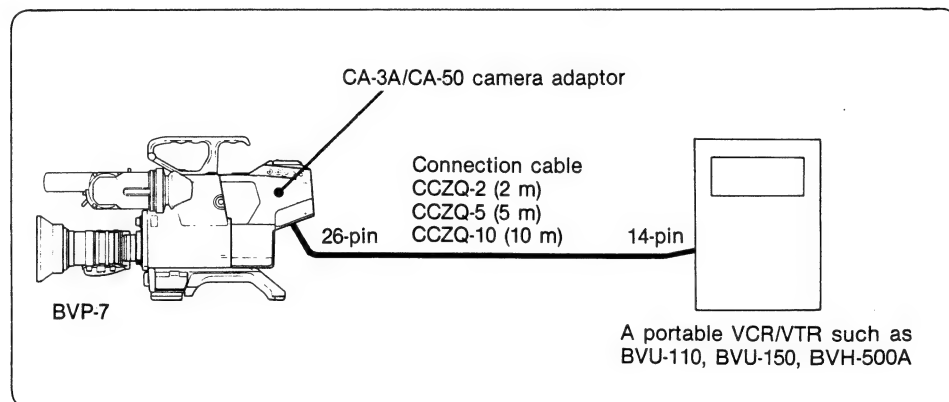
The BVP-7 can be used in combination with a variety of different VCRs providing that a CA-3A or CA-50 camera adaptor and an appropriate connection cable are used.

Connecting to a Betacam VCR



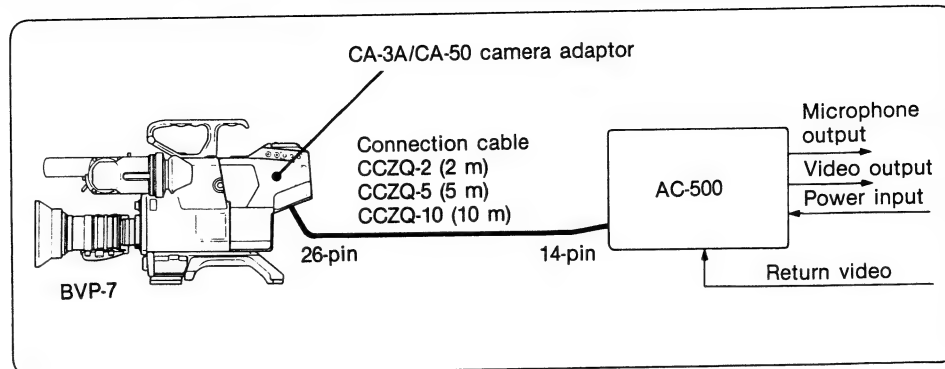
- A VA-1V VTR composite/component adaptor can be connected in the same way.
- A Betacam series portable VCR such as a BVW-25 can also be connected using a CCZ cable.

Connecting to a conventional portable VCR/VTR



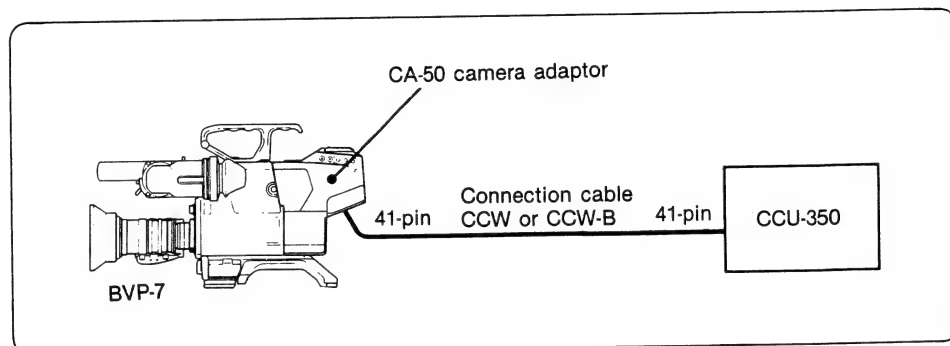
- If power is fed from the connected VCR through a connection cable whose length is 10 meters or longer, the picture quality may be affected as indicated by the BATT (battery) indicator in the viewfinder which will begin to blink.

Connecting to a VCR/VTR using an AC-500 ac adaptor



- When the AC-500 power adaptor is used, it is possible to supply power to the VCR/VTR as well as to the video camera using the 4-pin power cable.

Connecting to a VCR/VTR using a CCU-350 camera control unit



- When a CA-50 camera adaptor is attached to the BVP-7 and a CCU-350 camera control unit is connected, the video camera can be controlled from the CCU-350.

Functions which can be controlled using the controls located on the front panel of the CCU-350

- Automatic or manual iris selection and its adjustment
- Master black (pedestal) level adjustment
- Black balance adjustment (RED and BLUE can be adjusted independently.)
- White balance adjustment (RED and BLUE can be adjusted independently.)
- Painting control for automatic white balance
- GAIN (0/+9/+18 dB) selection
- Automatic or manual selection for black balance
- Automatic, manual or PRESET selection for white balance
- DETAIL (contour correction) adjustment
- Selection of the output signal (video signal/color bars/saw-tooth signal)
- ON/OFF of the electronic shutter
- TALLY call
- ON/OFF of the DCC function
- KNEE point setting

Notes

- When the ENC/RGB selector is set to the ENC position and the CCU-350 is connected to the BVP-7, only a luminance (Y) signal is output to the TEST OUT connector.
- If the BVP-7 is connected to a CCU-350 via a CA-50, the iris of the lens can be controlled from an MSU-360 or RCP-3600 series unit. However, the values shown in the IRIS POSITION display window on the unit will not be correct unless the iris control is set to the manual mode.

Functions which can be controlled using the potentiometers and selectors located inside the CCU-350

- SUBCARRIER PHASE adjustment
- HORIZONTAL PHASE adjustment
- INTERCOM connection selection (2-WIRE/4-WIRE)
- Selection of the electronic shutter speed

Shutter speed selection

The shutter speed can be selected from the CCU-350 as shown below.

Note that the SHUTTER selector of the BVP-7 is deactivated when the electronic shutter is turned on and the shutter speed is selected using the CCU-350.

Switch function	Setting of the CCU-350	Shutter speed
Toggle	SHUTTER switch: ON	Electronic shutter: ON
	SHUTTER switch: OFF	Electronic shutter: OFF
Rotary	0	LOCAL (See notes below.)
	1	1/100
	2	1/125
	3	1/125
	4	1/250
	5	1/500
	6	1/1000
	7	1/2000
	8	Electronic shutter: OFF
	9	" "
	A	" "
	B	" "
	C	" "
	D	" "
	E	" "
	F	" "

Notes

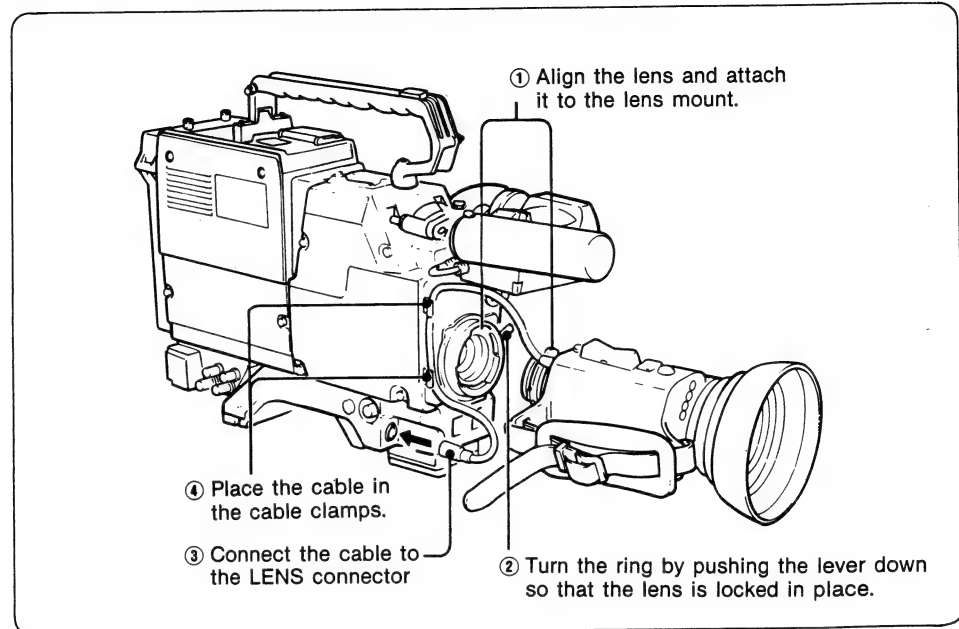
- In the "LOCAL" setting, the shutter speed cannot be controlled from the CCU-350. It must be selected from the BVP-7.
- The video camera will automatically be set to the "LOCAL" setting when it is controlled by a **CCU-300** or when an RM-P3 remote control unit is connected.

Attaching and Using Additional Equipment

Attaching a lens to the video camera

Proceed as follows:

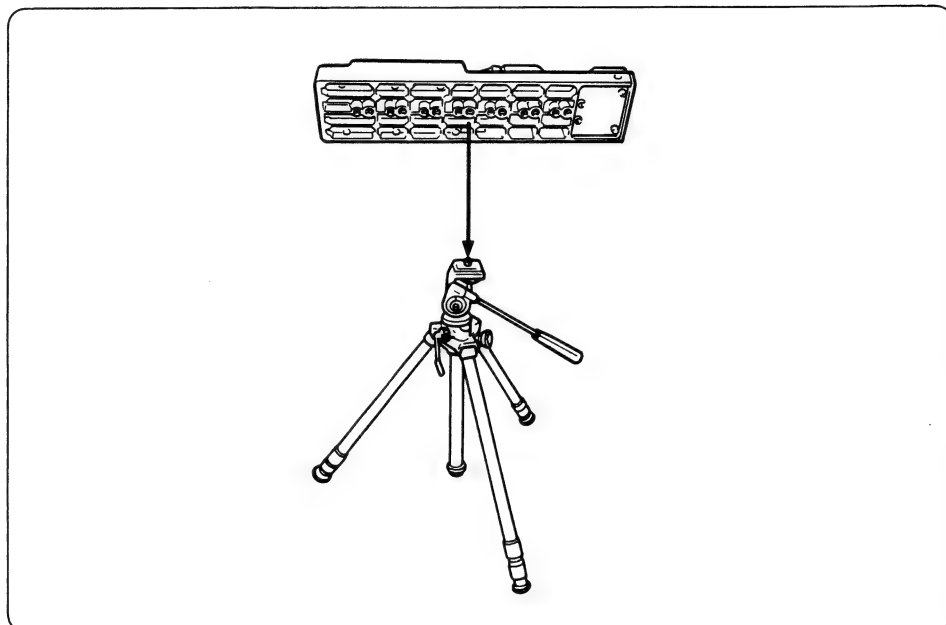
See the manual supplied with the lens for operating instructions.



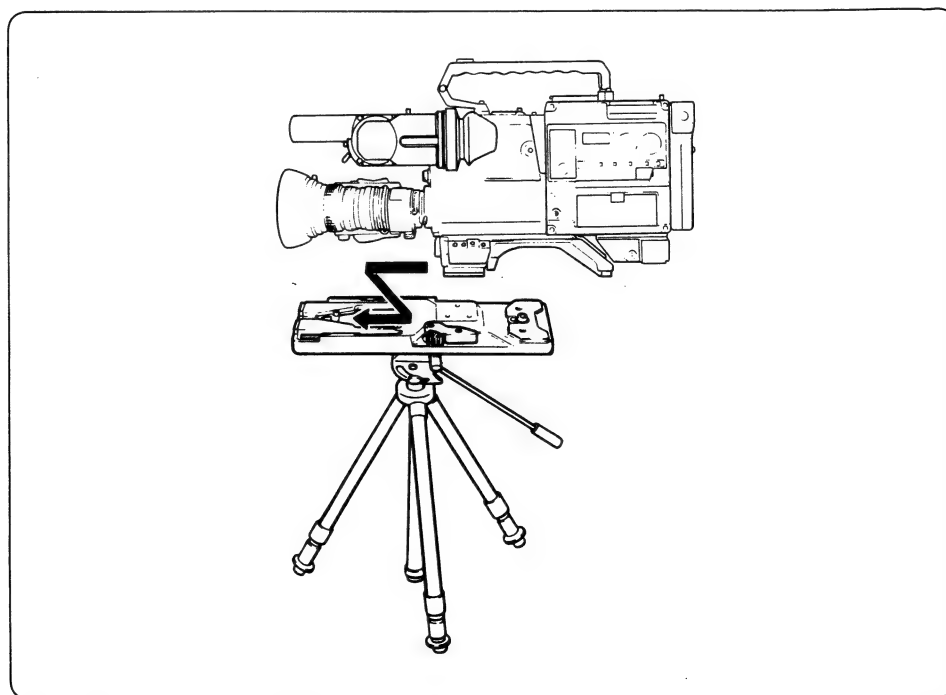
Attaching the video camera to a tripod using the tripod attachment

Proceed as follows:

- 1 Attach the tripod attachment to the tripod platform using the screw on the platform.
Note that there are two sizes of screw holes in the tripod attachment. Be sure to use the hole which fits the screw of the tripod platform you are using.



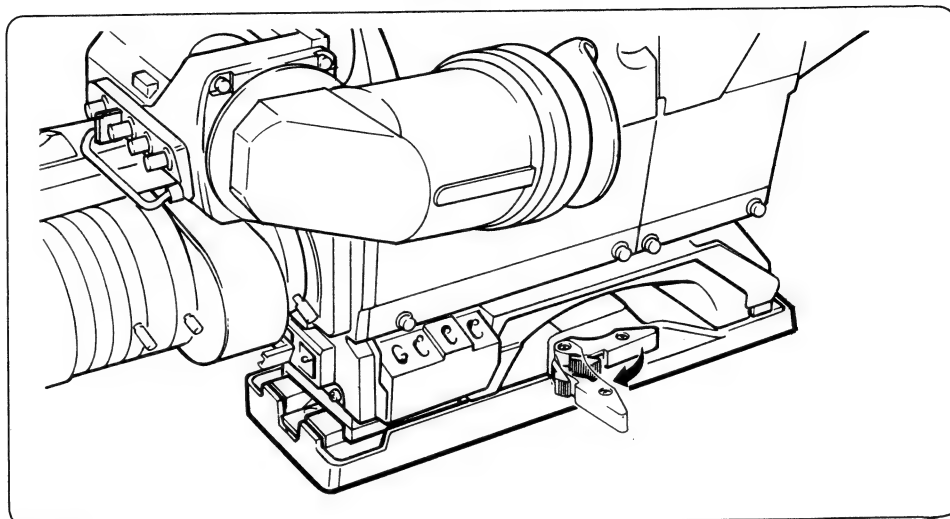
- 2 Attach the video camera to the tripod attachment by sliding it along the groove of the attachment until it clicks and locks.



Detaching the video camera from the tripod attachment

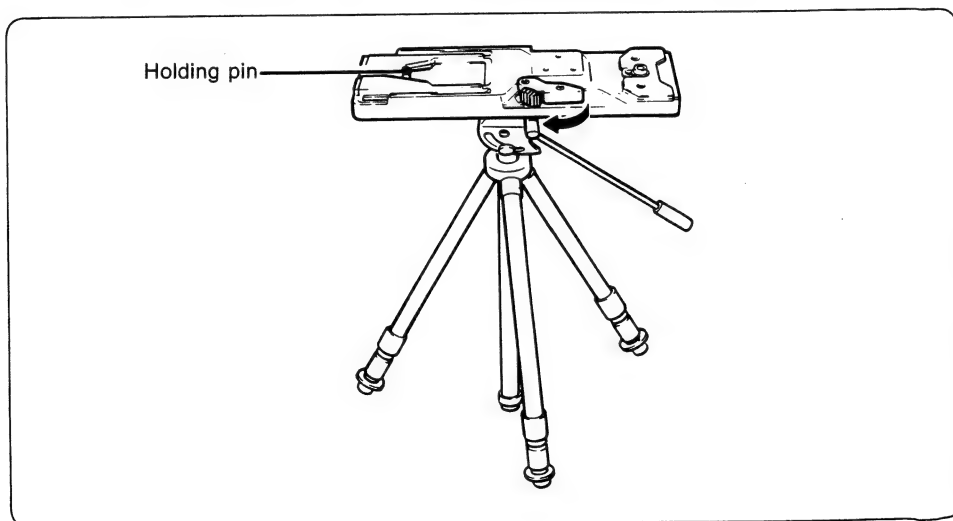
Proceed as follows:

While depressing the red button, move the lever in the direction indicated by the arrow and detach the video camera by pulling it back and up.



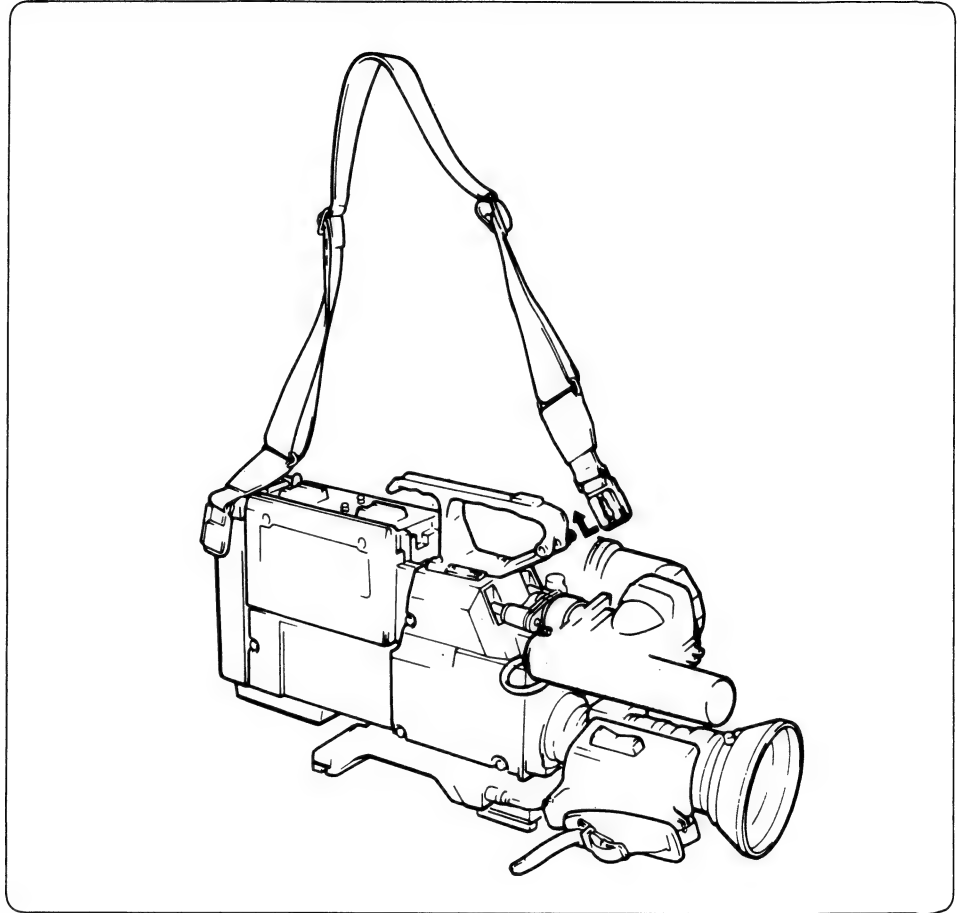
Note

- When the video camera has been detached, the holding pin may still protrude from the center of the groove. If this happens, the video camera cannot be reattached to the tripod attachment. In order to move the holding pin back to its correct position, move the lever in the direction indicated by the arrow while pressing the red button.

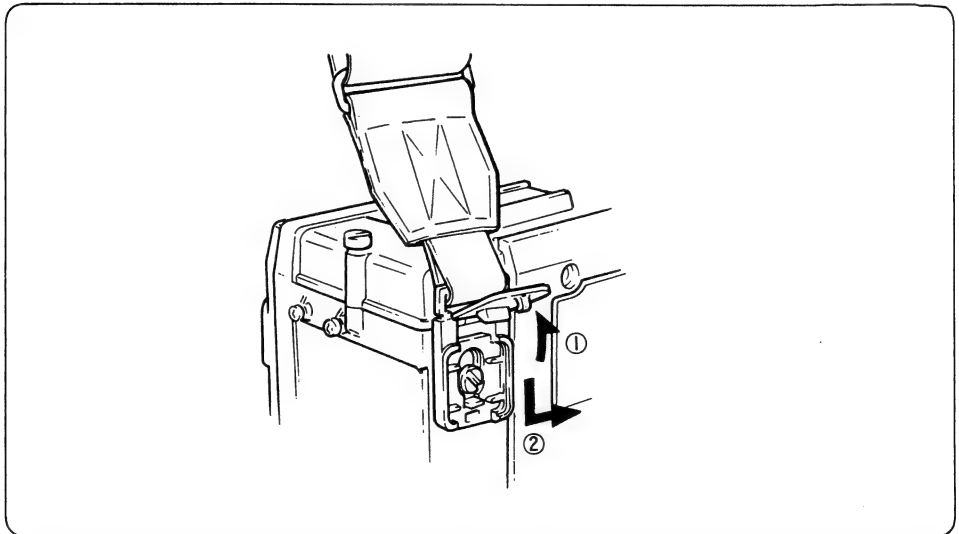


Attaching the shoulder strap

Attach the shoulder strap as illustrated below.



Detach the shoulder strap as illustrated below.

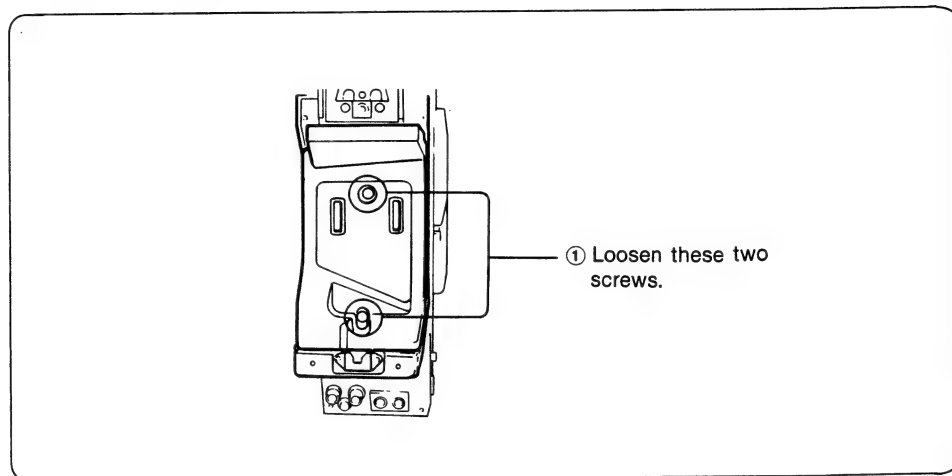


Attaching the chest pad

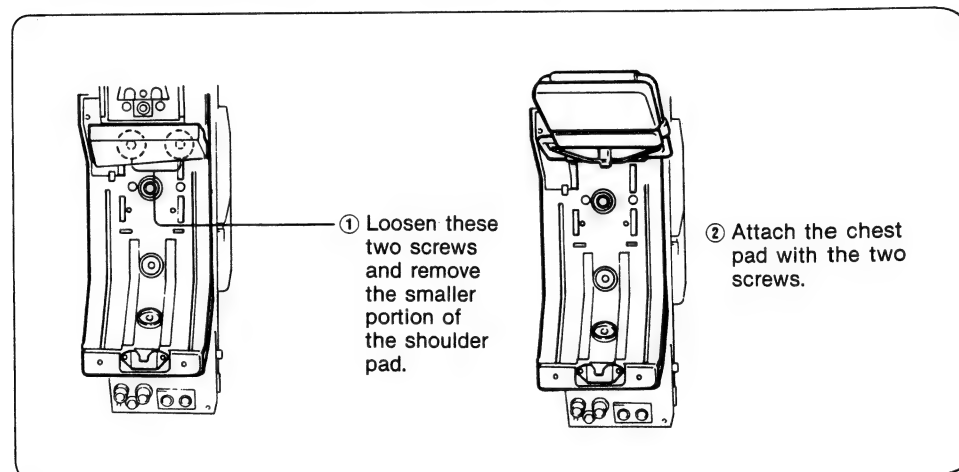
The chest pad can be attached to the video camera for greater handling ease when operating the video camera from your shoulder.
Proceed as follows:

Removing the shoulder pad

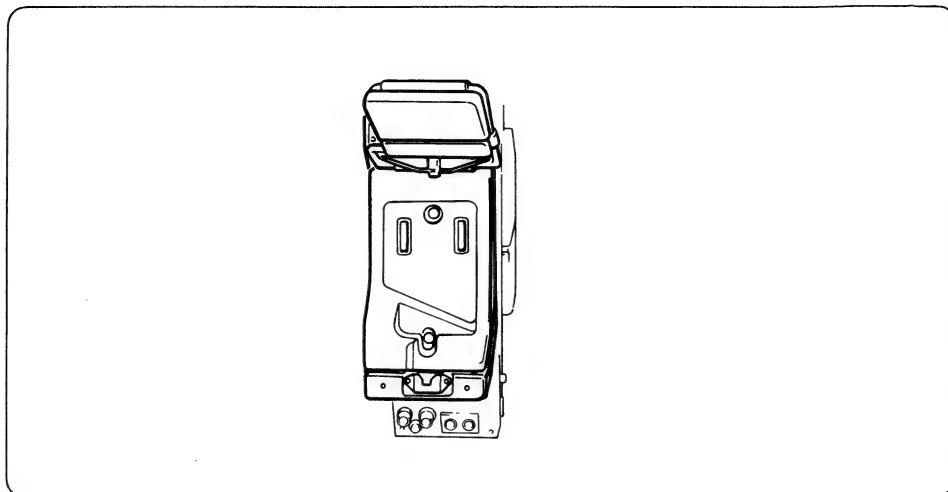
- 1 Detach the larger portion of the shoulder pad.



- 2 Replace the smaller portion of the shoulder pad with the chest pad.

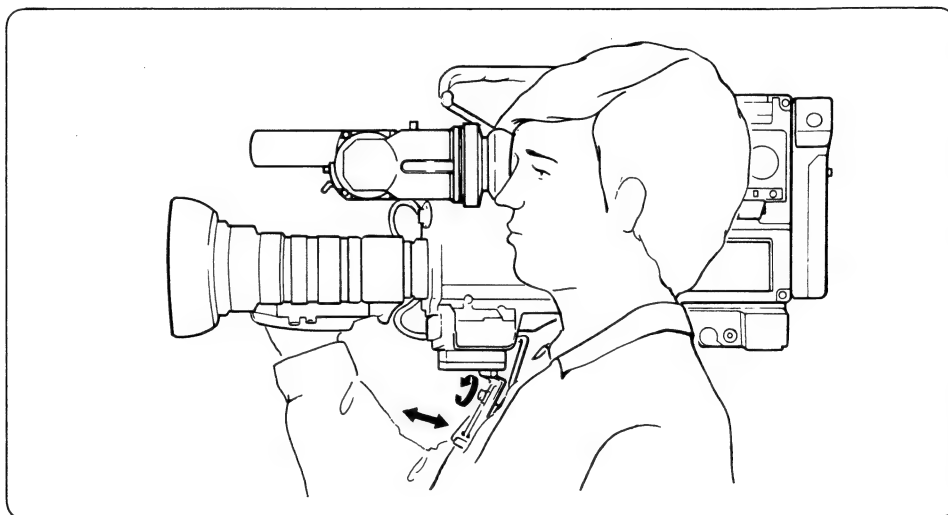


- 3** Attach the larger portion of the shoulder pad you have removed in step 1 with the two screws.



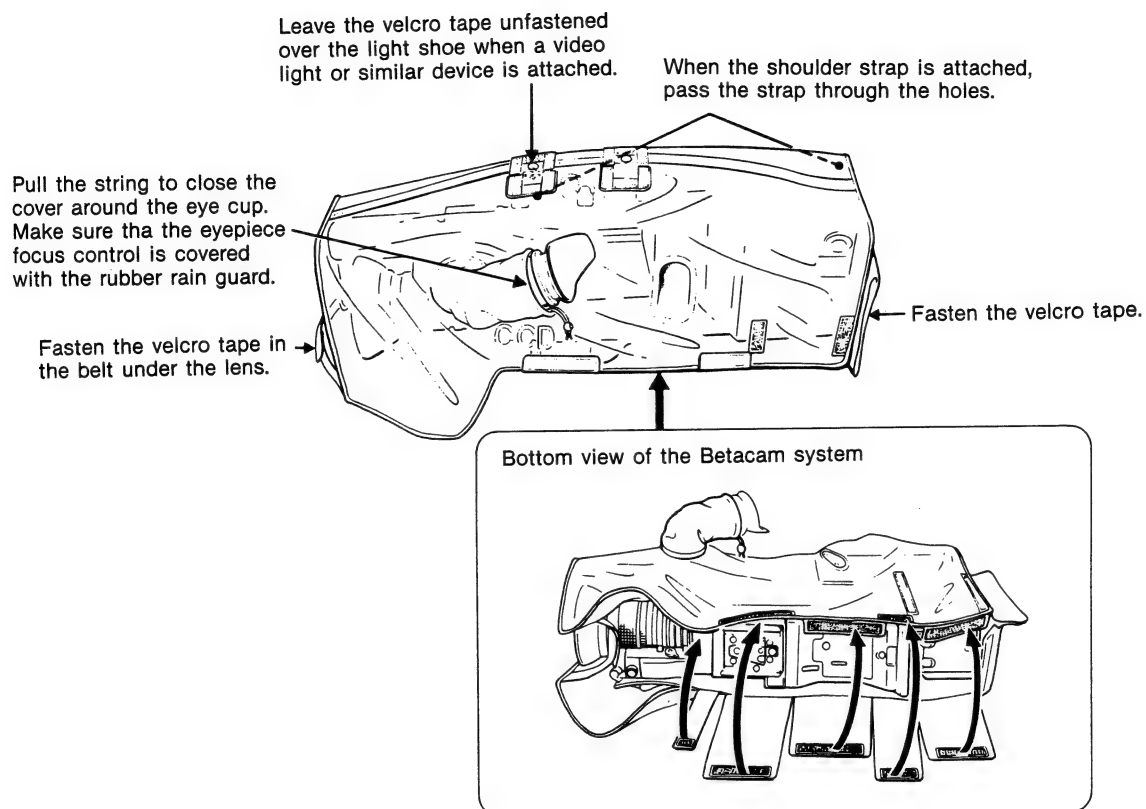
Adjusting the position

Loosen the screw and adjust the chest pad until it is in a comfortable position.



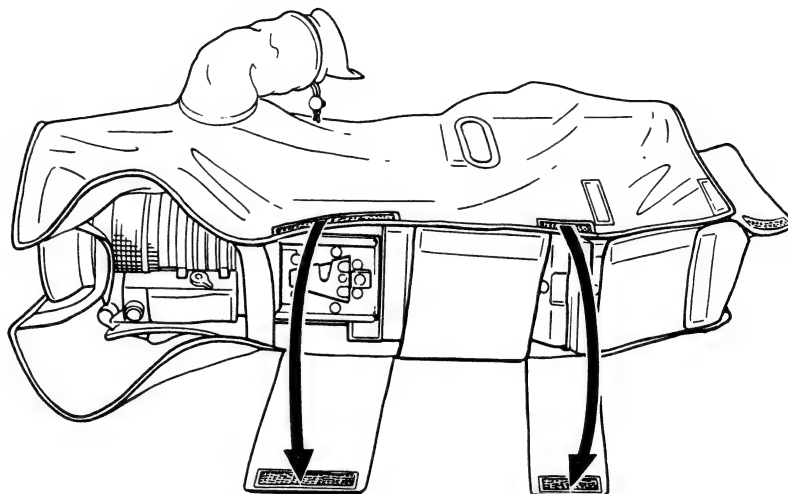
Putting on the rain cover

Covering a Betacam system



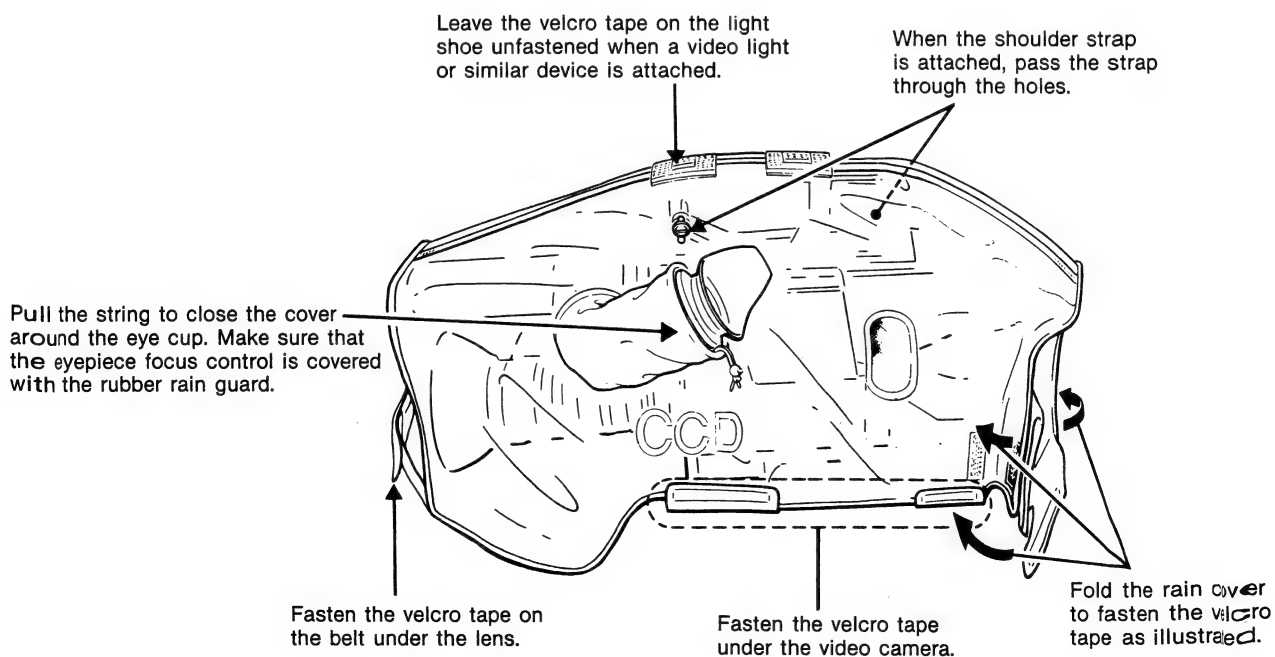
Attaching the covered Betacam system to the tripod attachment

Leave the velcro tape under the Betacam system unfastened as illustrated.



After attaching the Betacam system to the tripod attachment, fasten the velcro tape over the attachment.

Covering the video camera with a camera adaptor attached



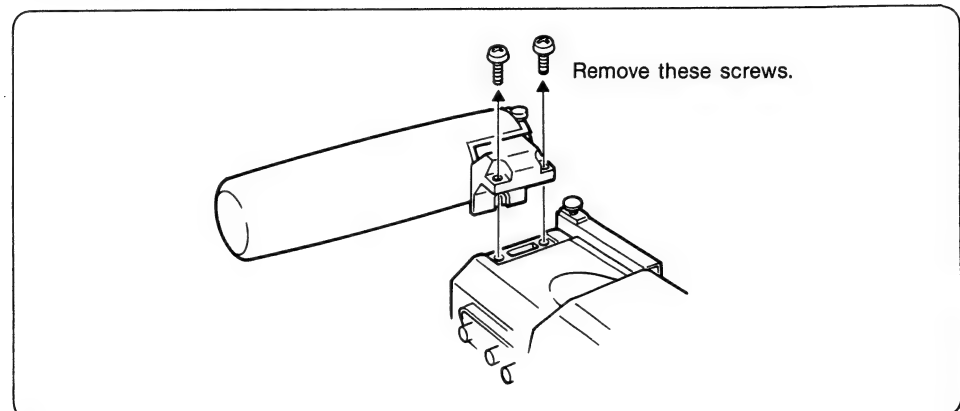
Using another microphone

Detaching the supplied microphone

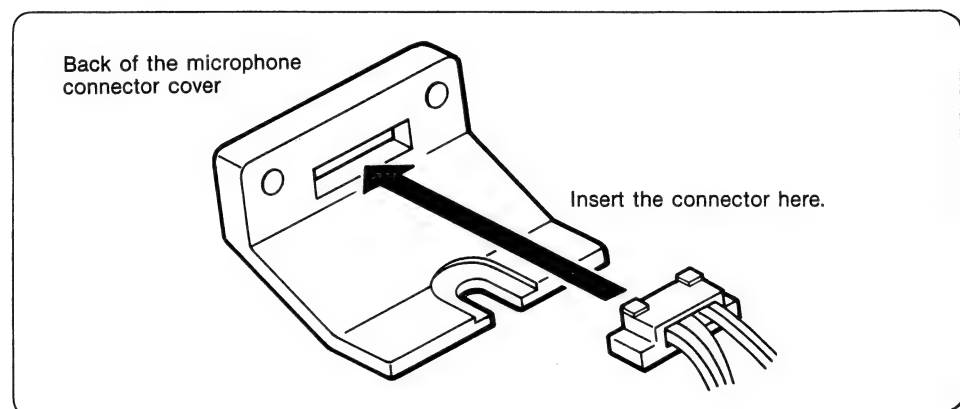
Note that after you have detached the supplied microphone from the viewfinder, be sure to attach the microphone connector cover (supplied) to the viewfinder to protect the viewfinder from rain.

To detach the microphone, proceed as follows:

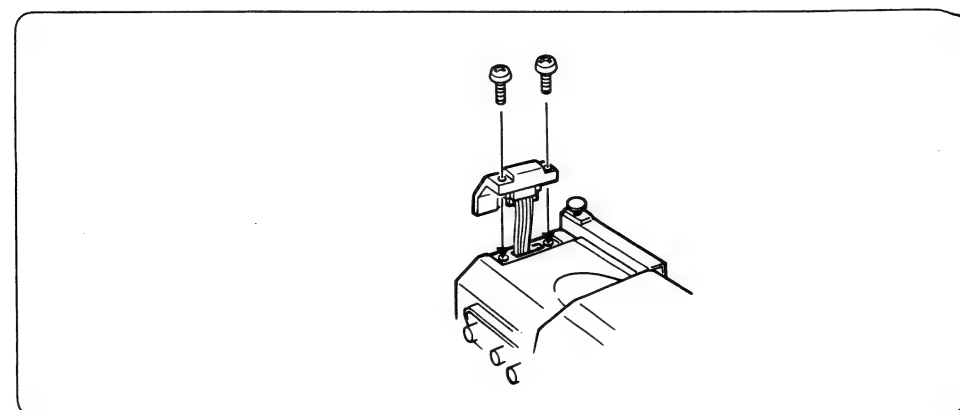
- 1 Remove the two screws and then disconnect the microphone connector.



- 2 Attach and fix the connector of the viewfinder to the microphone connector as illustrated.



- 3 Fix the microphone connector cover in place with the two screws you have removed.

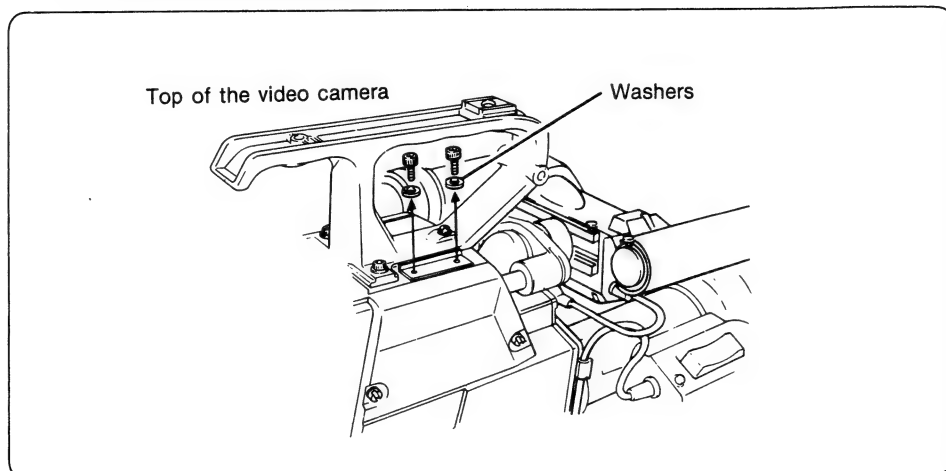


Attaching another microphone with a microphone suspension

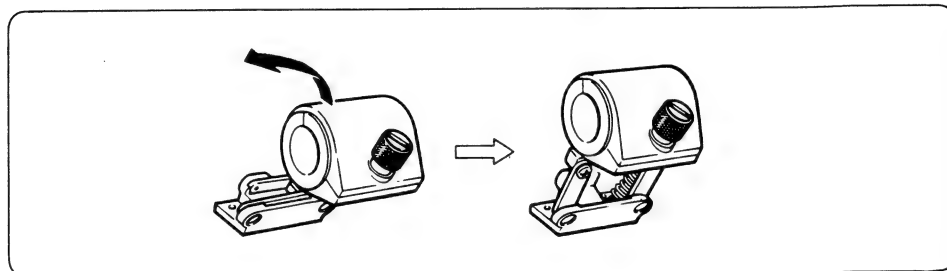
If a BVV-5 or another compatible Betacam VCR is directly attached to the BVP-7, use a CRS-3N microphone suspension (optional) so that the mechanical noise generated by the VCR is not recorded through the attached microphone.

To attach the microphone using the microphone suspension, proceed as follows:

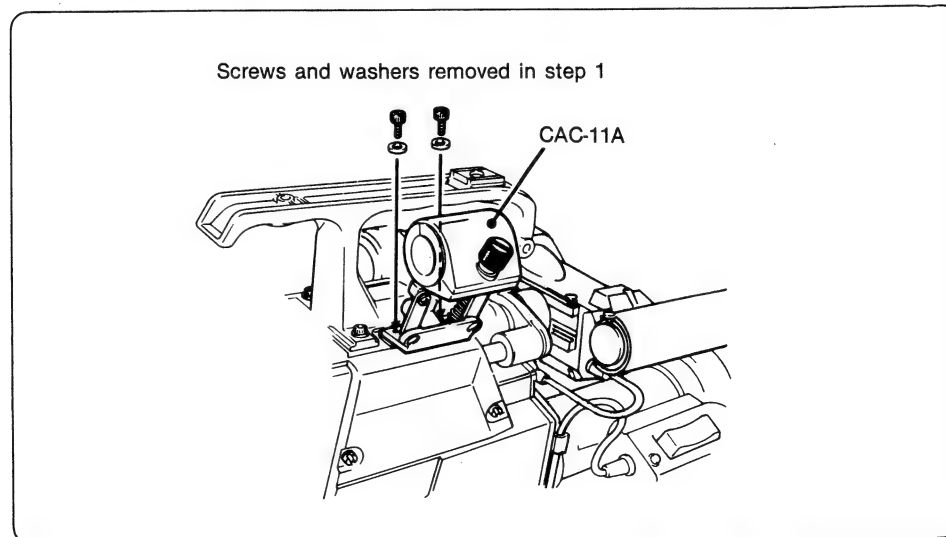
- 1 Remove the screws and washers.



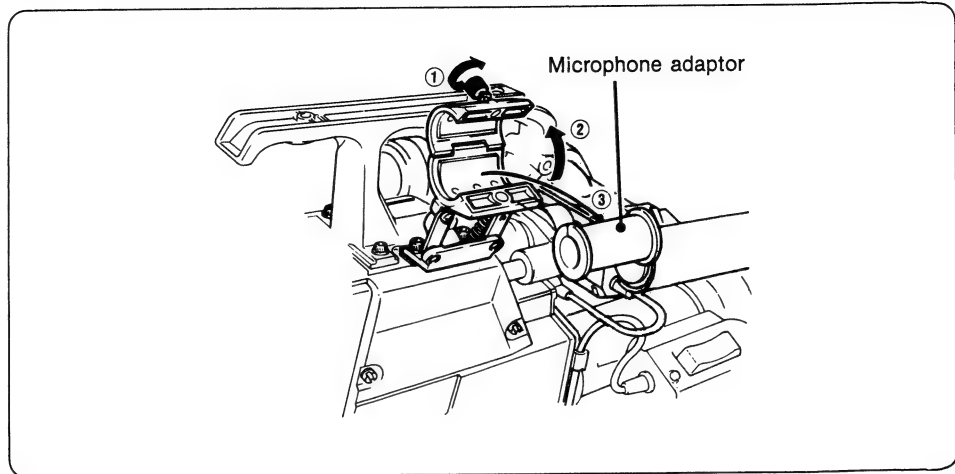
- 2 Prepare a CAC-11A microphone holder (optional) as illustrated, so the spring is stretched.



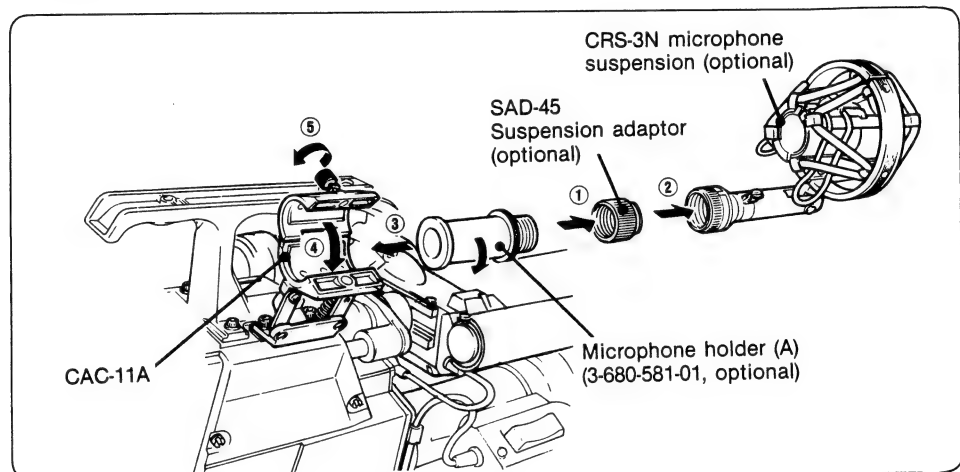
- 3 Attach the CAC-11A to the video camera using the screws and washers you have removed in step 1.



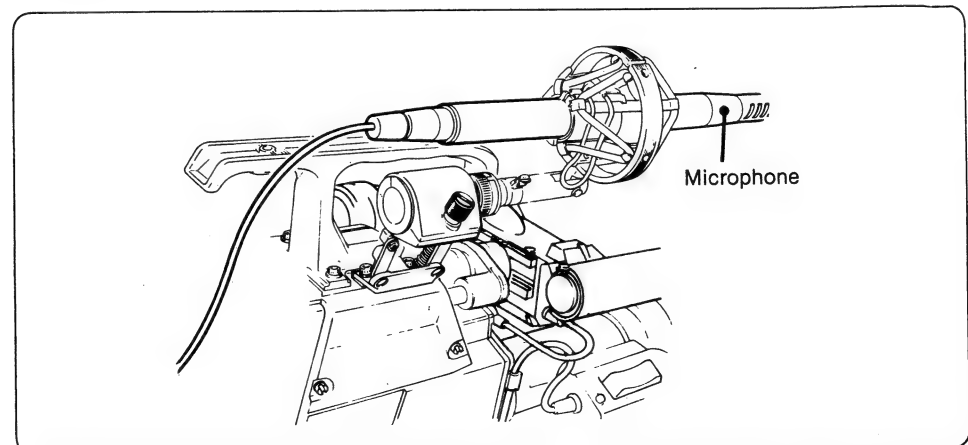
- 4** Take the microphone adaptor (supplied with the CAC-11A) out of the CAC-11A.



- 5** Attach the microphone suspension to the microphone holder (A) with a SAD-45 suspension adaptor (optional) and then attach it to the CAC-11A by the microphone holder (A).



- 6** Attach the microphone to the microphone suspension.

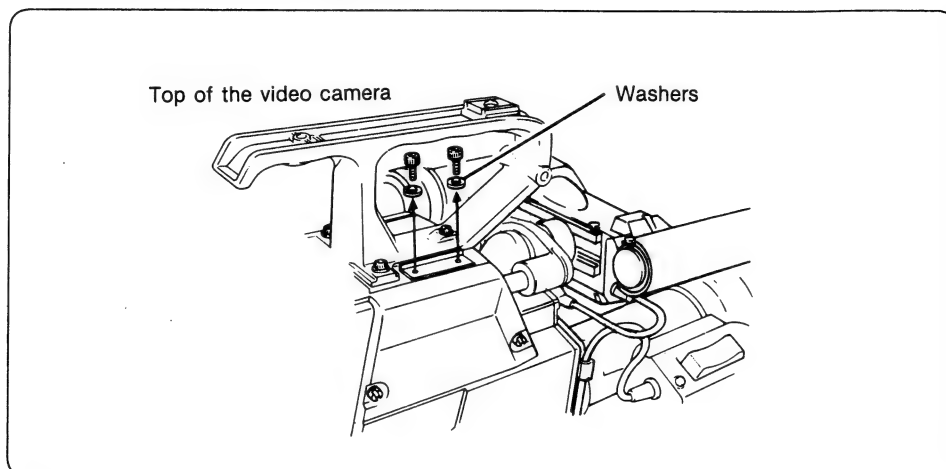


- 7** Connect the microphone cable to the MIC IN connector located on the VCR.

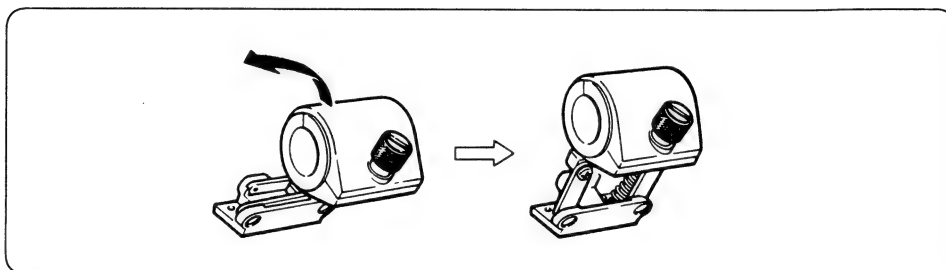
Attaching another microphone without a microphone suspension

If a CA-3A or CA-50 camera adaptor is attached to the BVP-7, the microphone can be used without using a CRS-3N microphone suspension (optional). Proceed as follows to attach the microphone to the video camera. If you use the BVP-7 with a BVV-5 or another compatible Betacam VCR attached directly, see the instructions directly preceding these.

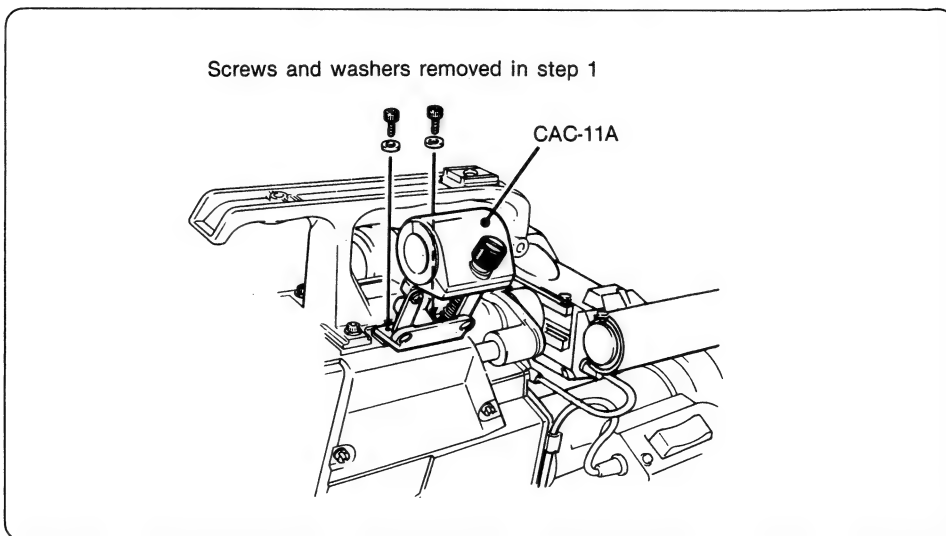
- 1 Remove the screws and washers.



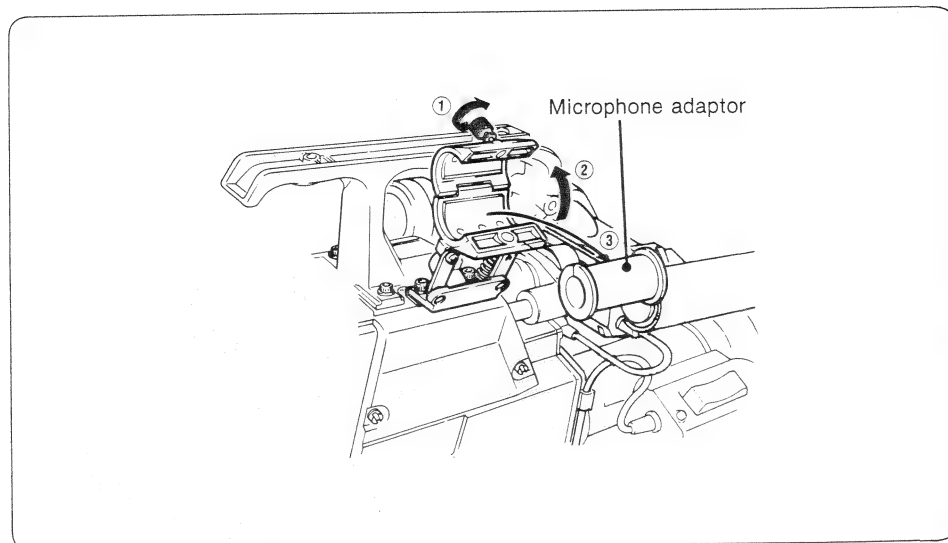
- 2 Prepare a CAC-11A microphone holder (optional) as illustrated, so the spring is stretched.



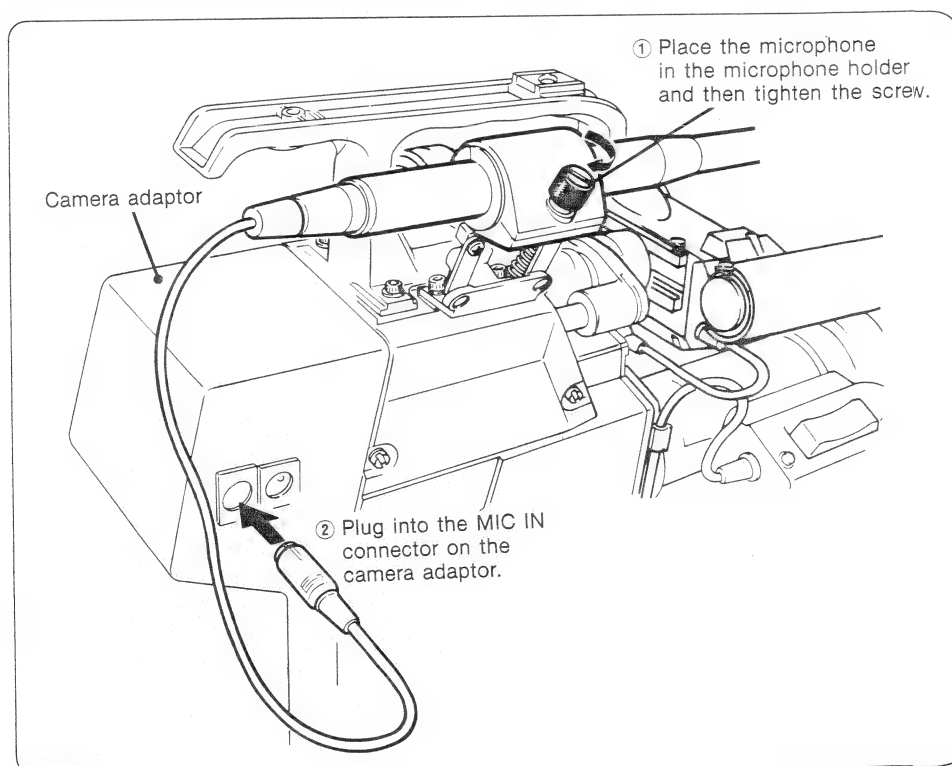
- 3 Attach the CAC-11A to the video camera using the screws and washers you have removed in step 1.



- 4 Take the microphone adaptor (supplied with the CAC-11A) out of the CAC-11A.



- 5 Hold the microphone by the microphone holder and tighten the screw.

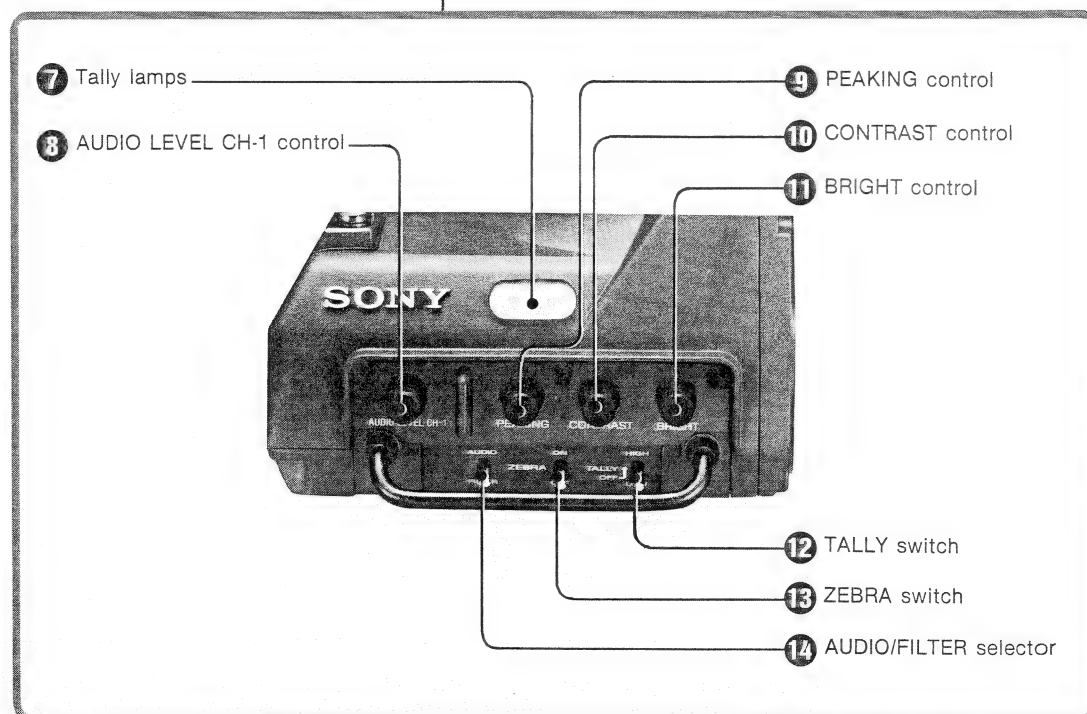
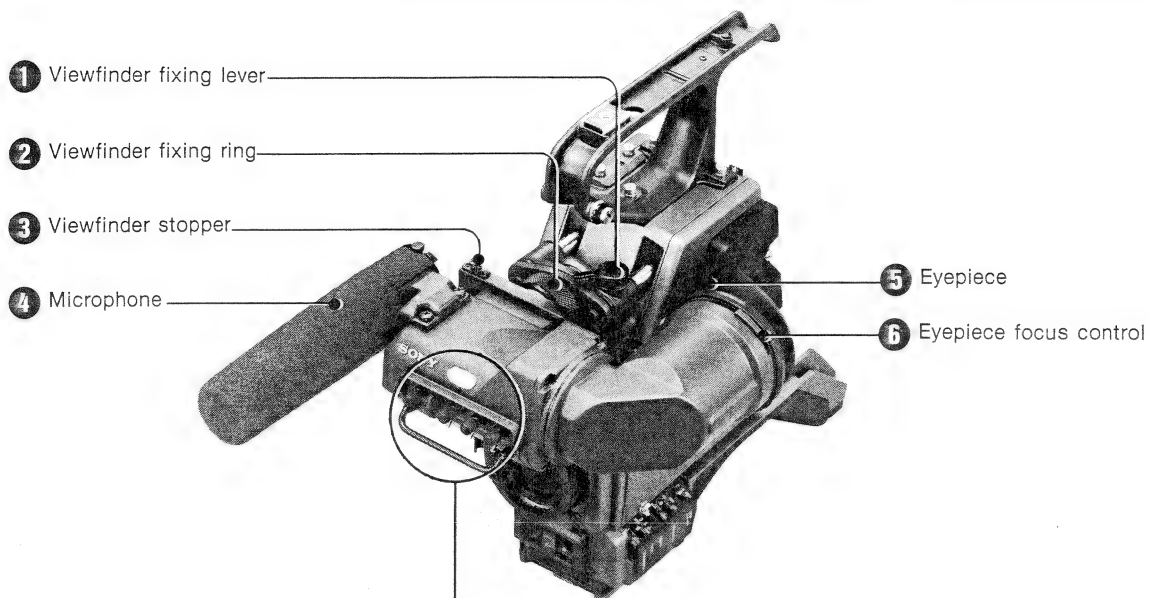


Note

- If the microphone is too slim to be held only by the microphone holder, use the microphone adaptor supplied with the microphone holder to hold microphone securely.

Operating the Viewfinder

Location and function of switches, controls, and mechanical parts

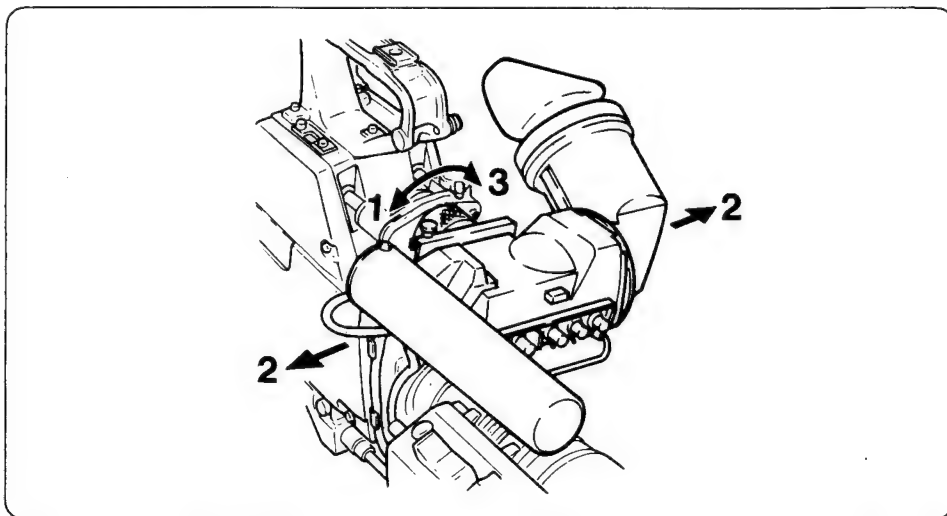


- 1 Viewfinder fixing lever**
Used to fix the viewfinder in the desired position if it is moved back and forth.
- 2 Viewfinder fixing ring**
Used to fix the viewfinder in the desired position if it is moved left and right.
- 3 Viewfinder stopper**
Used when detaching the supplied viewfinder.
- 4 Microphone**
This microphone picks up sound when shooting.
- 5 Eyepiece**
The screen of the viewfinder can be seen through this eyepiece.
- 6 Eyepiece focus control**
Used to adjust the focus in the eyepiece. This control is under the rubber rain guard.
- 7 Tally lamps (one pair)**
This pair of lamps indicates that the video camera is being used for recording with the attached VCR.
- 8 AUDIO LEVEL (audio recording level) CH-1 control**
Used to manually control the audio recording level on audio channel 1 when the AUDIO CH-1 MANU/AUTO switch on the attached VCR is set to the MANU position and the AUDIO/FILTER switch is set to the AUDIO position.
- 9 PEAKING control**
Used to sharpen the picture observed on the viewfinder screen so that the lens can be easily focused.
- 10 CONTRAST control**
Used to adjust the picture contrast on the viewfinder screen.
- 11 BRIGHT (brightness) control**
Used to adjust the picture brightness on the viewfinder screen.
- 12 TALLY (HIGH/OFF/LOW) switch**
Used to activate the tally lamps located at the front of the viewfinder unit.
- 13 ZEBRA (zebra pattern ON/OFF) switch**
Used to activate the zebra pattern generator. The zebra pattern appears in a part of picture (where the IRE level is 70%) on the viewfinder screen so that the iris can be adjusted properly without using a waveform monitor.
- 14 AUDIO/FILTER selector**
Used to select the item to be displayed with the FILTER/AUDIO indicators in the viewfinder.

Adjusting and using the viewfinder

The viewfinder can be adjusted for use by either the left or right eye by moving it until the eye cup is in the most comfortable position for you. The viewfinder can also be shifted back and forth by 20 mm ($\frac{3}{16}$ in.).

Left and right side adjustments



- 1** Loosen the fixing ring.
- 2** Move the viewfinder to the left or right position.
- 3** Tighten the ring.

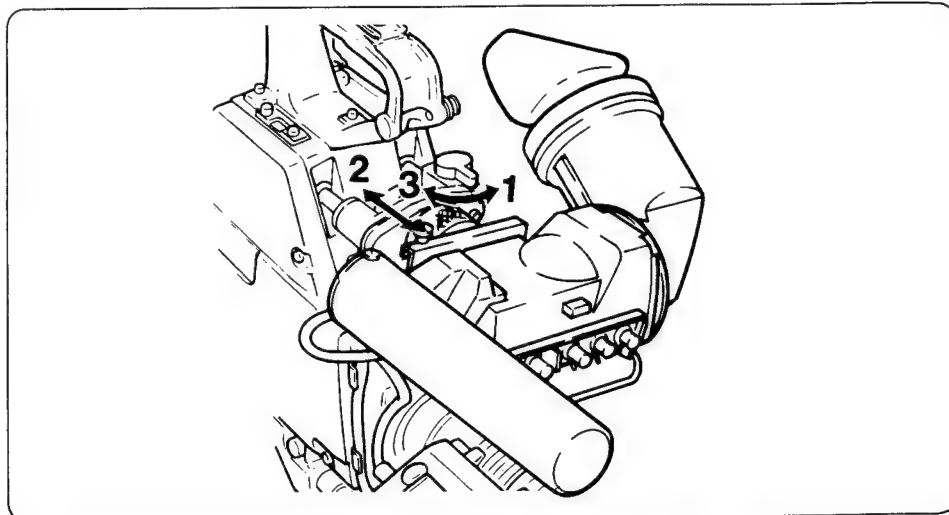
To remove the viewfinder from the video camera

First, loosen the fixing ring. Then, slide the viewfinder to the left (while you are facing the lens) while pulling the viewfinder stopper up.

To store the video camera in its carrying case

Loosen the fixing ring. Move the viewfinder to the left as far as it will go (while you are facing the lens) and tighten the ring.

Back and forth adjustments

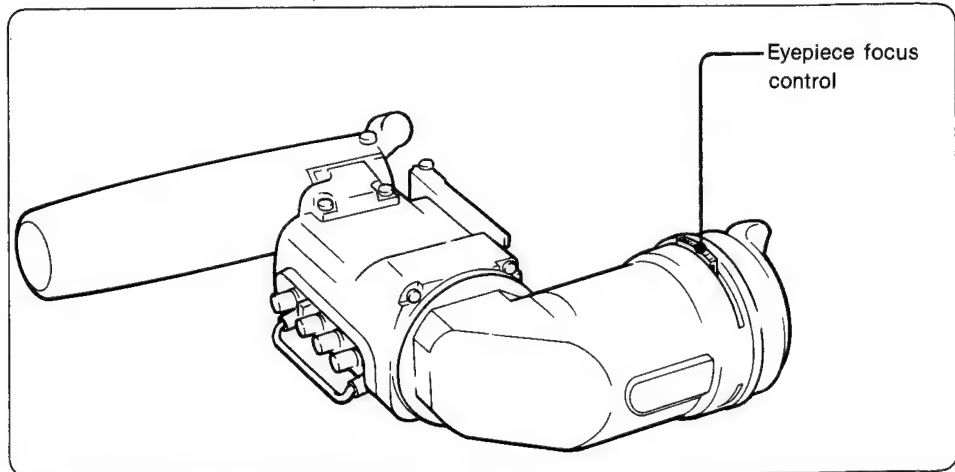


- 1** Loosen the fixing lever.
- 2** Move the viewfinder forwards or backwards until the desired position is reached.
- 3** Tighten the lever.

Adjusting the focus of the camera eyepiece

Eyeiece focus adjustment

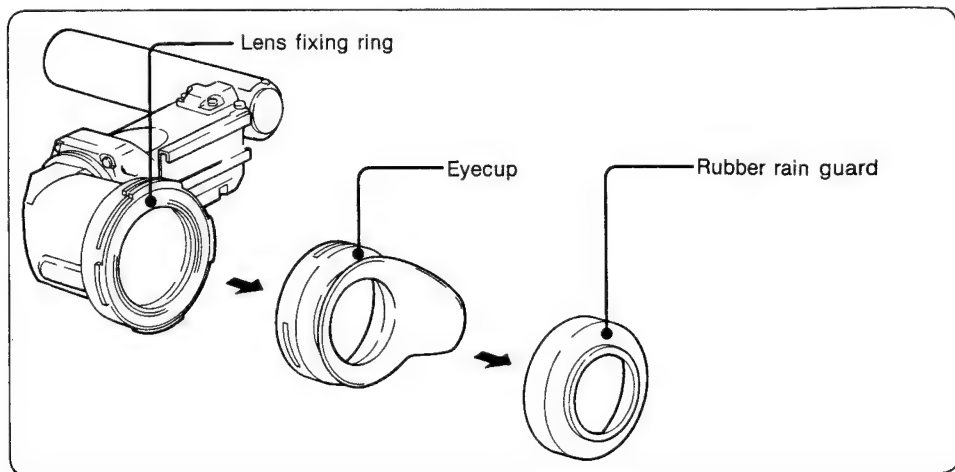
Pull and fold back the rubber rain guard and turn the eyepiece focus control until the clearest focus has been obtained, then cover the control with the rubber rain guard again.



Detaching the eyepiece

First, remove the rubber rain guard and then the eyecup. If you want to clean the lens, turn the lens fixing ring counterclockwise and remove the ring first. Then turn the eyepiece focus control fully counterclockwise and face the lens down so that the lens can be removed.

When attaching the lens, do not place it upside down and be sure the position of the eyepiece focus control.



Adjusting the controls

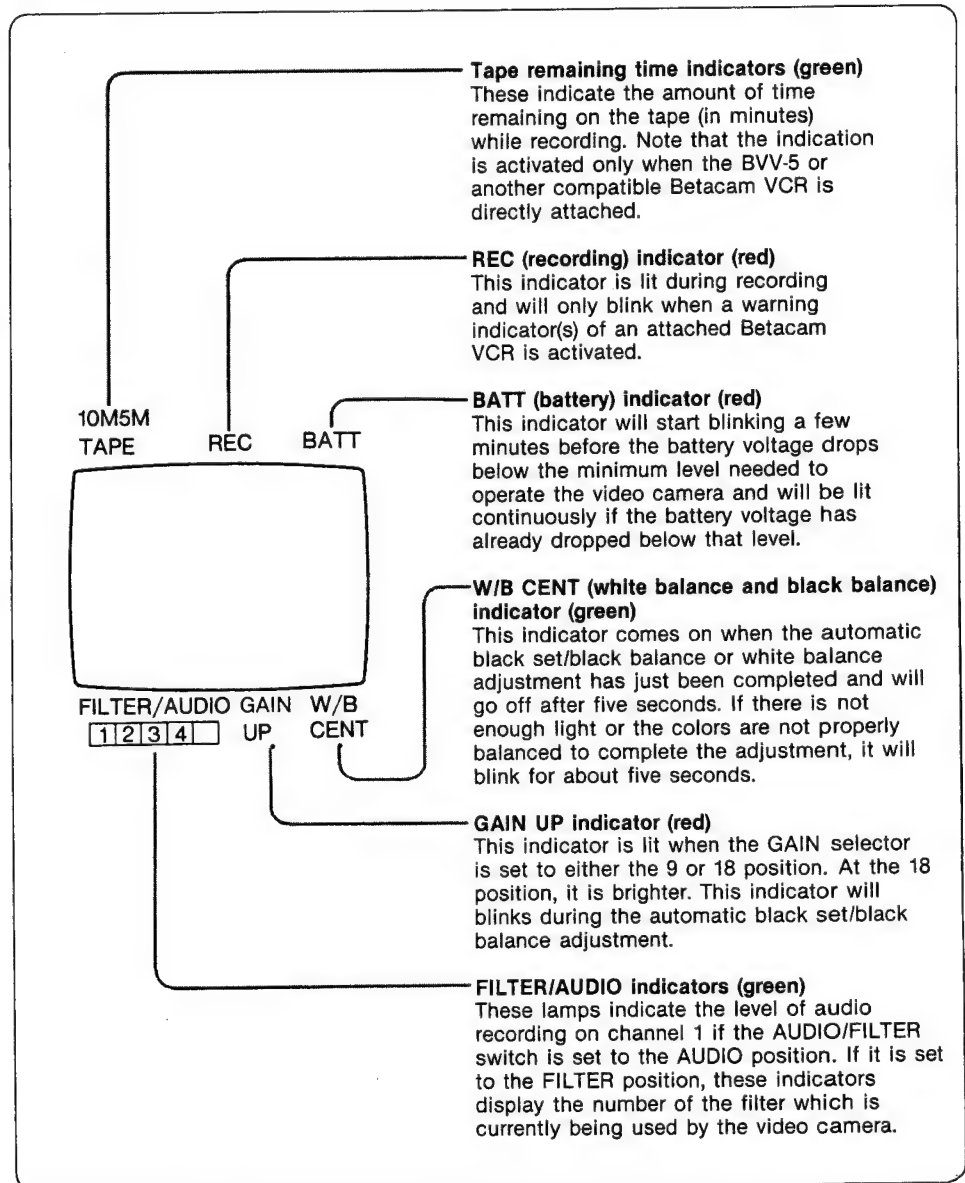
Brightness: Turn the BRIGHT control to find the optimum brightness level.

Contrast: Turn the CONTRAST control to find the optimum contrast level.


Sharpness: Turn the PEAKING control to find the optimum sharpness.

Indicators

There are several lamps in the viewfinder which give the following operational warnings.



The remaining time on the tape indicated by the tape remaining time indicators
These indicators are activated only when a BVV-5 or another compatible Betacam VCR is directly attached to the video camera.

Remaining time	20	15	10	5	2	0 (minute)
Indicators	10M5M	10M	5M	5M		 : Blinks (1 Hz)
REC indicator	REC				REC*	* : Blinks (4 Hz)

On-screen display

The setting of the selectors, insufficient lighting conditions and the selected shutter speed can be displayed on the viewfinder screen. There are a total of three display modes which are numbered 1 through 3. The number of items to be displayed differs from mode to mode as follows:

In display mode 1: A minimum number of items will be displayed.

In display mode 2: Several items will be displayed in addition to those displayed in mode 1.

In display mode 3: A maximum number of items will be displayed.

For the number and kinds of items displayed in each mode, see the table in the "Displaying the selector settings" section on the next page.

Selecting the display mode

Proceed as follows:

- 1** Set the OUTPUT/DCC selector to the BARS position.
- 2** Push the AUTO W/B BAL switch up to the WHT position. Every time the switch is pushed up, the display mode will change.

Note

- The display mode which has been selected will be retained in memory for about a week even if power is cut off. After about a week, the memory will automatically be reset to mode 3.

Displaying the selector settings

When the video camera is first turned on, each of the selectors (except for the GAIN selector) and the position to which it is currently set will be displayed one after the other for three seconds each. If a selector setting is changed, the new setting will be displayed directly after the change for three seconds.

The table below shows the items which will be displayed.

In the corresponding mode:

N: not displayed

Y: displayed

Display	Description	Mode		
		1	2	3
GAIN : 0DB	Setting of the GAIN selector (0 dB, 9 dB or 18 dB)	N	N	Y
DCC : ON	Setting of the OUTPUT (DCC ON/OFF) selector (ON or OFF)	Y	Y	Y
FILTER : 1	Setting of the FILTER selector (1, 2, 3 or 4)	N	N	Y
WHITE : PRESET	Setting of the WHITE BAL selector (PRESET, A or B)	Y	Y	Y
0.0K	Color temperature	N	Y	Y
WHITE : PRESET	Setting of the WHITE BAL selector (PRESET, A or B)	Y	Y	Y
0.0K	Color temperature	N	Y	Y

Note

- The value of the color temperature is 1000 times that of the displayed figure, and is an approximate value.

Displaying insufficient lighting conditions

The table below shows the items which will be displayed if the lighting conditions are not suitable for shooting.

Display	Description	Mode		
		1	2	3
: MEMORY NG (Colon blinks.)	No values for the white and black balances have been stored. Adjust the white and black balances.	Y	Y	Y
: LOW LIGHT (Colon blinks.)	There is insufficient light, and the video signal is lower than the specified level.	N	N	Y

Displaying and selecting the shutter speed (SS)

Although the SHUTTER selector can be set to either the ON or OFF position, it automatically returns to the ON position after it is pushed down to the SEL position unless it is held there.

Activating the electronic shutter and displaying the current shutter speed

Set the SHUTTER selector from the OFF position to the ON position.

In display mode 1 or 2	The current shutter speed will be displayed for about three seconds.
In display mode 3	The current shutter speed will be displayed continuously.

Display example SS:1/100

Note

- If you want to check the current shutter speed while the video camera is in either display mode 1 or 2, just push down the SHUTTER selector once and it will be displayed for about three seconds.

Switching the electronic shutter speed

- 1 Push the SHUTTER selector from the ON position down to the SEL position.

In display mode 1 or 2	The current shutter speed will be displayed as shown below.
In display mode 3	A colon will also be displayed to the left of the "SS" indication.

Display example : SS:1/100

- 2 When you see the additional colon, set the selector back to the ON position, then push it down again to the SEL position, and the shutter speed will change to the next selection.

In display mode 1 or 2	The newly selected shutter speed will be displayed for about three seconds.
In display mode 3	The newly selected shutter speed will be displayed continuously, but the colon on the left will go out after about three seconds.

The shutter speed is changed in the order shown below:

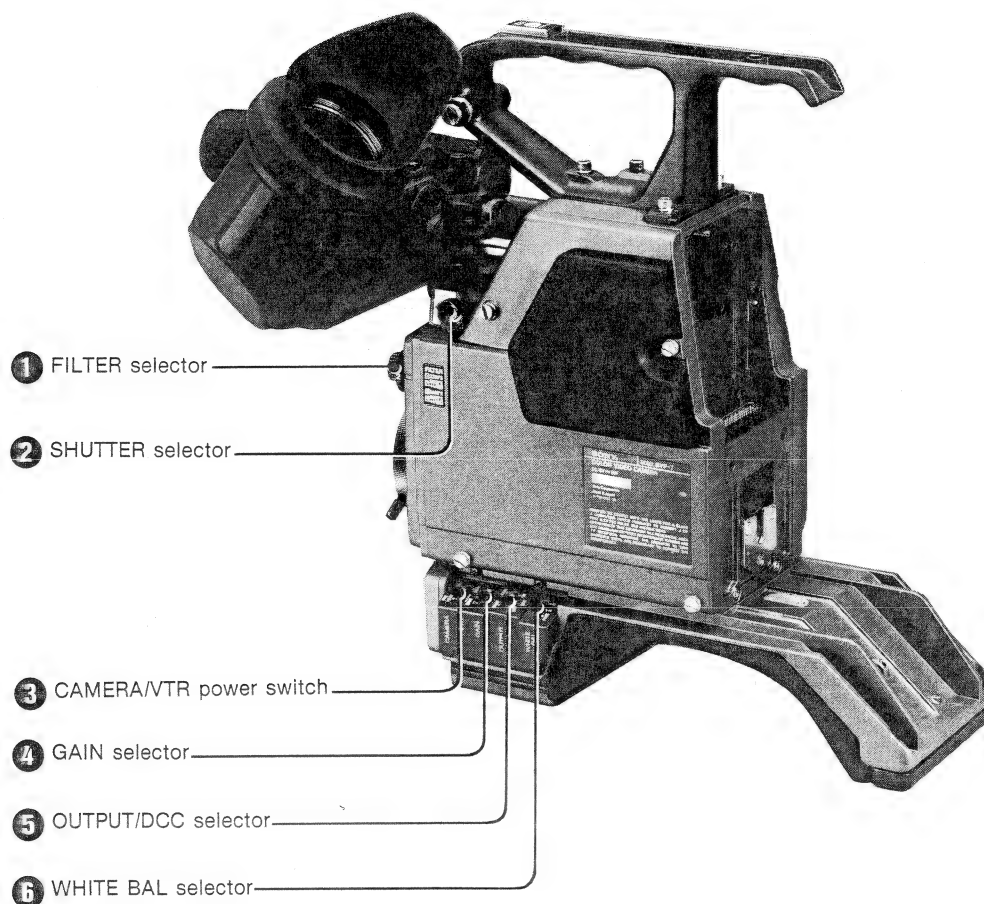
→ 1/100 → 1/125 → 1/250 → 1/500 → 1/1000 → 1/2000 →

Notes

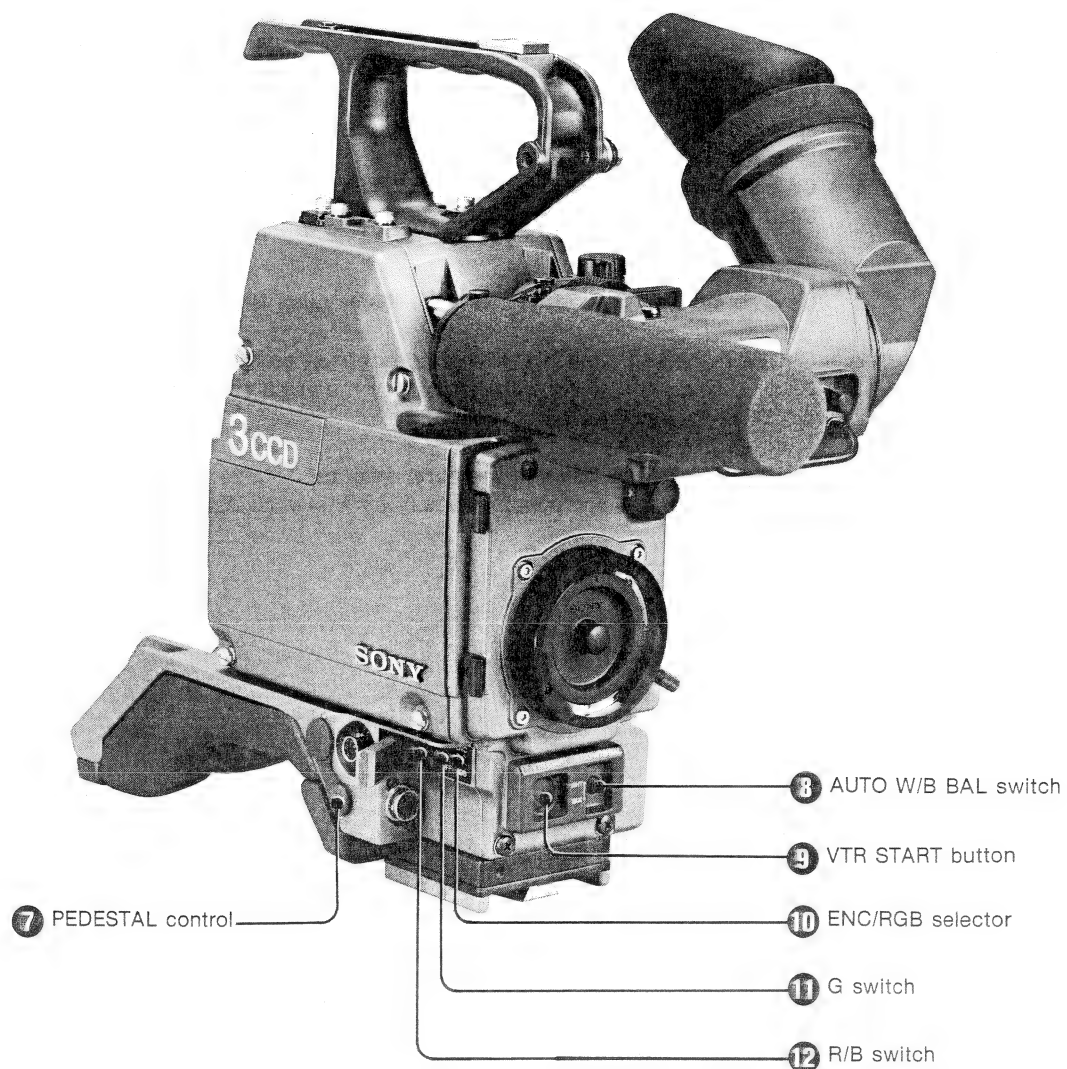
- When the colon on the far left is not displayed, the shutter speed cannot be changed even if you push the SHUTTER selector down to the SEL position.
- The faster the shutter speed the more the iris will open and shorter the depth of focus will become.
- The shutter speed you have selected will be retained in memory unless a new value replaces it or the power is cut off. If power is lost, the value will be retained for about one week. After that it will return to its original 1/100 setting.
- Bear in mind that although the light from ordinary room lamps appears to be steady, in reality the light from these lamps (especially fluorescent and mercury-arc lamps) flickers in accordance with the frequency of its power source. When shooting is done in either of these kinds of light using an electronic shutter, the flicker which normally occurs in the light being output from the video camera may be more pronounced. However, by setting the shutter speed to 1/100 the flicker can be reduced, providing that the frequency of the power being supplied to the lamp is 50 Hz.

Shooting

Location and function of switches and controls on the camera unit



- 1 Filter (color temperature conversion filter) selector**
Used to select the appropriate filter for the light source being used.
- 2 SHUTTER (electronic shutter) selector**
Used to activate the electronic shutter. The shutter speed can be selected and the speed will be displayed on the view finder screen.
- 3 CAMERA (PREHEAT/ON)/VTR (SAVE/STBY) power switch**
Used to control the power supplied to the video camera and the attached VCR.
- 4 GAIN selector**
Used to increase the video gain if the illumination is insufficient.
- 5 OUTPUT (BARS/CAM)/DCC (dynamic contrast control ON/OFF) selector**
Used to select the signal to be output by the video camera at the VTR connector and the TEST OUT connector.
- 6 WHITE BAL (white balance memory) selector**
Used to select the appropriate memory for the white balance adjustment.



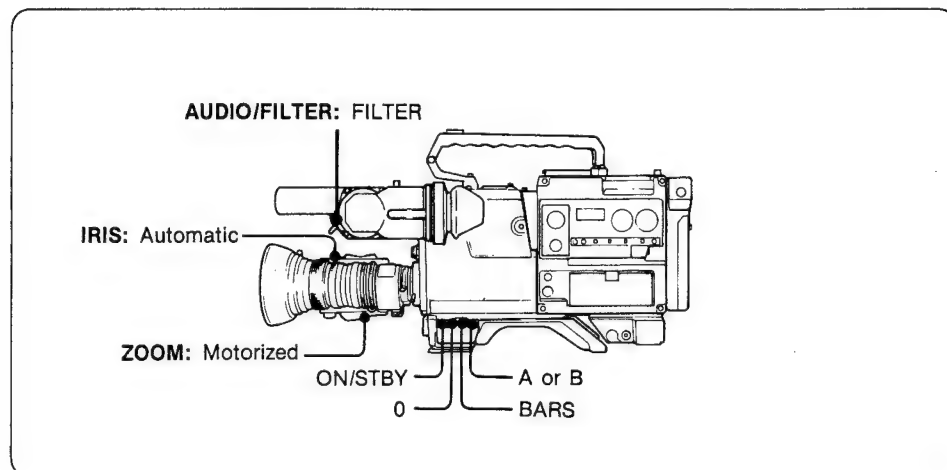
- 7 PEDESTAL control**
Used to set the master pedestal level in the composite video to be output.
- 8 AUTO W/B BAL (automatic white/black balance adjustment) switch**
Used to adjust the black set/black balance and the white balance.
- 9 VTR START button**
Used to start or stop recording with an attached VCR.
- 10 ENC/RGB selector**
Used with a combined setting of the G and R/B switches to select the signal to be output to the TEST OUT connector.
- 11 G (Green/OFF) switch**
Used to select the signal to be output to the TEST OUT connector when the ENC/RGB selector is set to the RGB position.
- 12 R/B (Red/OFF/Blue) switch**
Used to select the signal to be output to the TEST OUT connector when the ENC/RGB selector is set to the RGB position.

Checking functions and adjusting color balance

Checking functions

To test the basic functions of the video camera, proceed as follows:
For details on how to use the lens, see the manual supplied with the lens.

- 1 Set the selectors as illustrated below and then set the POWER switch on the VCR to the ON position.



- 2 Adjust the position of the viewfinder and then the BRIGHT and CONTRAST controls.
- 3 Check that the color bars appear on the viewfinder screen, then turn the BRIGHT and CONTRAST controls on the front of the viewfinder until the color bars on the viewfinder become clear.
- 4 With the OUTPUT/DCC selector set to the BARS position, push the AUTO W/B BAL switch up to the WHT position and check the display mode.
Each time the switch is pushed up, the mode will change in the following order: 1, 2 and 3.
- 5 Change the filter selector setting in the following order: 1, 2, 3 and 4. While changing, check that the lamp number which corresponds to the filters being used changes also in the viewfinder.
- 6 Switch the OUTPUT/DCC selector to the CAM position and then shoot a subject. Adjust the focus by turning the focus ring. Check to see that the picture appears on the viewfinder screen.
- 7 Set the zoom control to automatic (motorized) and then check the motorized zoom function by pressing the zoom switch. While shooting, check to be sure that the zoom ring is turning.
- 8 Set the zoom control to manual and check the manual zoom function by manually turning the zoom ring.
- 9 Set the iris control to automatic, then shoot two different subjects each of which is in a different lighting condition. While shooting, check to be sure that the iris ring is turning.

- 10** Set the iris control to manual then check the manual iris control function by manually turning the iris ring.
- 11** Press and hold down the instant auto iris button on the lens unit to temporarily activate the automatic iris control, then shoot two different subjects each of which is in a different lighting condition. While shooting, check to be sure that the iris ring is moving.
- 12** Set the iris control back to automatic then shoot a subject. While shooting, turn the gain selector from 0 to 9 to 18 in that order. Check that the iris closes more as the gain is increased and that the GAIN UP indicator in the viewfinder lights up.
- 13** Set the GAIN selector back to the 0 position. The basic function test has been completed.

Adjusting black set/black balance

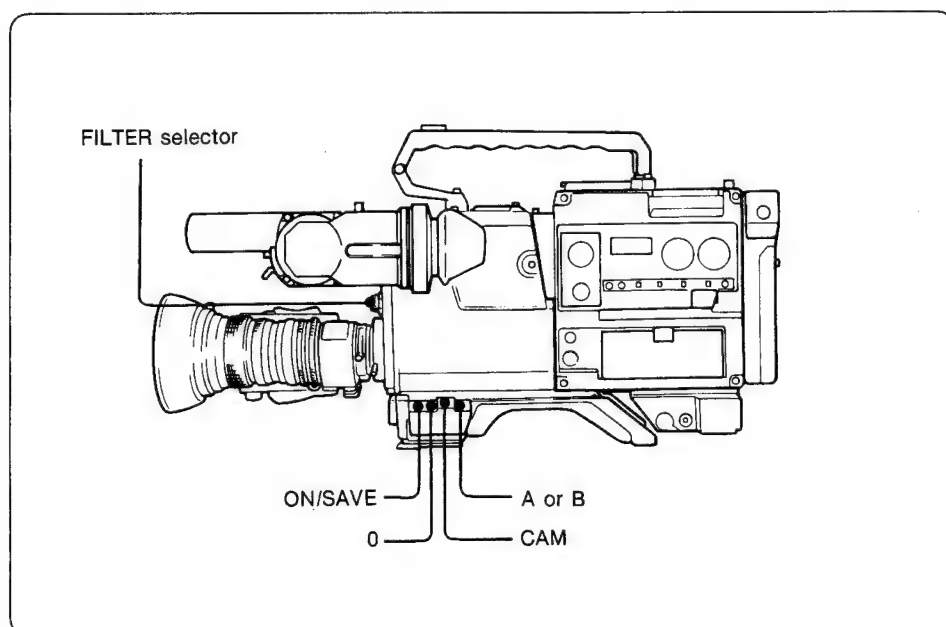
Ordinarily it is not necessary to adjust the black set/black balance. Adjustment is needed when:

- The BVP-7 will be used for the first time.
- The BVP-7 has not been used for a long time.
- There has been a radical change in the environmental temperature.

If any of these conditions exist, adjust the black set/black balance in the following way.

Procedure

- 1 Set the selectors as illustrated below. The FILTER selector may be set to any position.



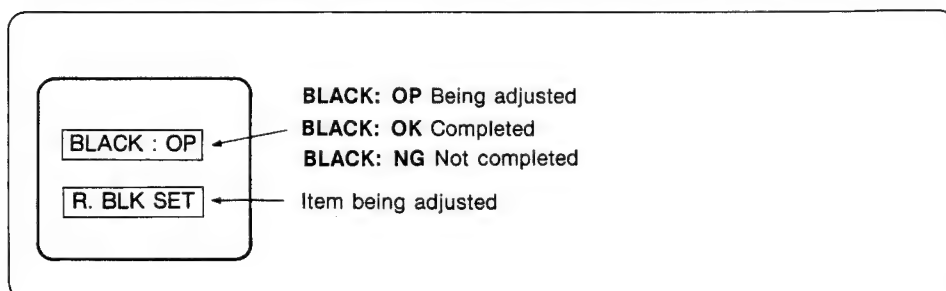
- 2 Push the AUTO W/B BAL switch down to the BLK position and hold it there until the black set/black balance adjustment is complete (usually 2 to 15 seconds are needed). Adjustment consists of five phases in which the black set as well as the black balance are adjusted.

The five phases are performed in the following order:

R.BLK SET → B.BLK SET → G.BLK SET → R.BLK BAL → B.BLK BAL

While the adjustment of each phase is being made, "BLACK:OP" will be displayed on the viewfinder screen. When all five are completed, the "BLACK:OK" display will be replaced by the "BLACK:OK" display and the W/B CENT indicator in the viewfinder will light up. The adjusted black set/black balance values will then be automatically stored in the video camera's memory.

If, for some reason, the black set/black balance adjustment cannot be completed, the "BLACK:NG" display will appear and the W/B CENT indicator will blink.



If the black set/black balance adjustment cannot be completed

The viewfinder screen will display "BLACK:NG" together with one of the following explanatory notes below. Perform the black set/black balance adjustment again.

Display	Cause
HARD ERROR TRY AGAIN	The adjusted values were not stored.
OVER FLOW TRY AGAIN	The difference between the reference value and the adjusted values was too great for the automatic adjustment to be performed.
TIME LIMIT TRY AGAIN	The adjustment was not completed within the specified time limit.
IRIS: NOT CLOSED TRY AGAIN	The iris was not closed during the adjustment.
BOUNCING: TOO LONG TRY AGAIN	The black set adjustment was not completed within the specified time limit.

Notes

- The iris of the lens automatically closes during black set/black balance adjustment whether or not the iris is set to automatic or manual. However, if the iris is set to manual, it will be necessary to open it manually following the black set/black balance adjustment so that the white balance adjustment and/or shooting can begin.
- If the AUTO W/B BAL switch is pushed down to the BLK position, the GAIN selector circuit will be activated, automatically causing the viewfinder screen to flicker several times during the black set/black balance adjustment. This is a normal occurrence and should not be considered a malfunction.
- As was described in this section, the black set is automatically adjusted along with the black balance by pushing the AUTO W/B BAL switch down to the BLK position. However, the black set can also be adjusted manually by using the potentiometers inside the video camera. See the maintenance manual for more details.
- If the "BLACK: NG" display appears on the viewfinder screen again and again while you are attempting to adjust the black set/black balance, the video camera should be checked for malfunctions by a qualified service person.

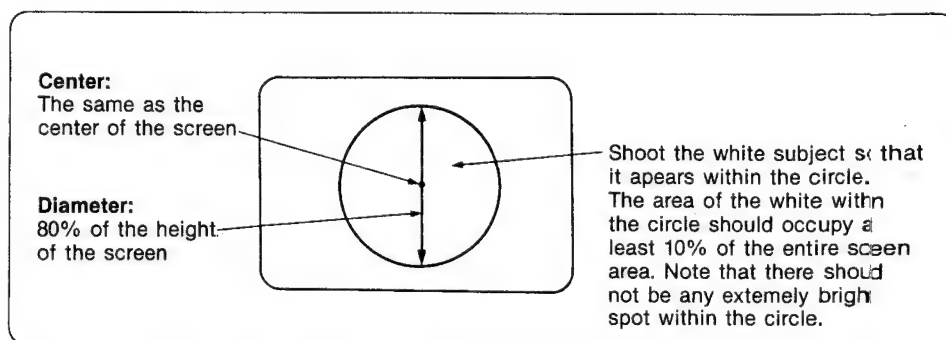
Adjusting white balance

Procedure

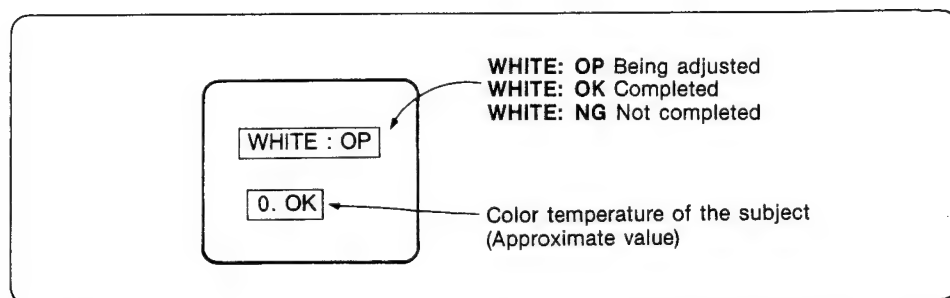
- 1 Set the FILTER selector to the position which is appropriate for the light source being used. See the table below.

Filter number	Color temperature	Lighting condition
1	3200 K	Sunrise, sunset or in a studio
2	5600 K + $\frac{1}{4}$ ND	Outdoors under clear skies
3	5600 K	Cloudy or rainy
4	5600 K + $\frac{1}{16}$ ND	Clear and bright conditions such as those encountered at high altitudes or by the sea

- 2 Place a white object, such as a piece of cloth or paper in front of the video camera and zoom in on it. The object should be shot in the same light source as the one which will be used for recording. The illustration below shows the minimum white area on the screen required for the adjustment.



- 3 If the lens is equipped with an automatic iris control, set the iris AUTO/MANJ selector on the lens unit to automatic. If not, adjust the iris manually.
- 4 The white balance can be adjusted or set to the factory-preset value. Before adjusting the white balance, set the WHITE BAL selector to either the A or B memory position. An A value and a B value for each of four filters (a total of eight values) can be stored in these two memories. Once both the filter and memory have been chosen, push the AUTO W/B BAL switch up to the WHT position and hold it there (note that unless you hold this switch in place, it will automatically return to its central setting) for the one second it takes for the adjustment to be made and the value stored. During this adjustment and after its completion, the following will appear on the viewfinder screen.
 WHITE:OP will be displayed during adjustment.
 WHITE:OK will be displayed when the adjustment is complete.
 (The W/B CENT indicator in the viewfinder will also be lit.)
 To set the white balance value for a lighting condition other than the one used to set the first value, repeat the above procedure for each filter you want to use. **Note that you must change the filter selection and/or the WHITE BAL selector setting before making another adjustment, otherwise the value you have just stored will be replaced by the new value.** Each filter can have one value stored in the A memory, and one stored in the B memory.



If the white balance adjustment cannot be completed

The viewfinder will display "WHITE:NG" together with one of the following explanatory notes below and the W/B CENT indicator in the viewfinder will blink.

Display	Cause
LOW LEVEL TRY AGAIN	The video output level was too low to complete the white balance adjustment. (Increase the illumination or set the GAIN selector to a higher position.)
HARD ERROR TRY AGAIN	The adjusted value was not stored.
TIME LIMIT TRY AGAIN	The adjustment was not completed within the specified time limit.
C.TEMP.LOW CHG.FILTER TRY AGAIN	The color temperature was too low. (Select the appropriate filter with the FILTER selector.)
C.TEMP.HIGH CHG.FILTER TRY AGAIN	The color temperature was too high. (Select the appropriate filter with the FILTER selector.)

Before trying to perform the white balance adjustment again, check to see that the proper filter has been selected, then reset the necessary selectors. When you are sure, try again.

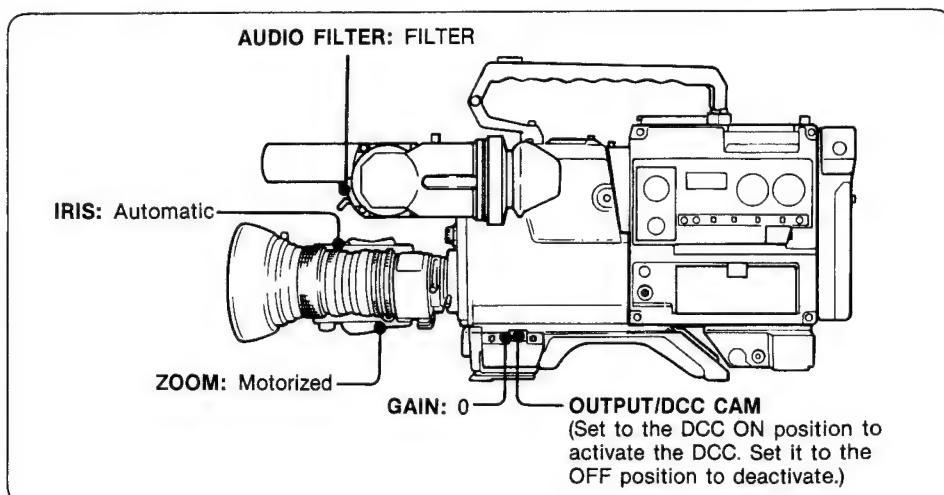
Notes

- Once the black set/black balance adjustment has been completed, as indicated when the W/B CENT indicator in the viewfinder comes on, adjustment of the white balance can begin immediately by pushing the AUTO W/B BAL switch up to the WHT position.
- If the light source in which the subject is to be shot changes, only the white balance must be adjusted.
- The stored white balance values will be kept in memory unless readjustments are made or the power is cut off. Once power is no longer available, the values will be retained for about one week.
- Overcompensation (hunting) of the iris in the zoom lens before final iris setting is obtained is likely to occur when the automatic iris control of the lens is activated. Should this happen, adjust the automatic iris control gain of the lens unit. See the manual supplied with the lens for instructions.
- If you do not need to display the result of each adjustment, switch the display mode to mode 1.
- If necessary, the number of the memories used to store the white balance values can be cut down from eight to two using the switch inside the video camera. When using only the two memories, A and B, the stored values will not correspond to the filter selections. See the maintenance manual for more details.

Operating the video camera

Preparation

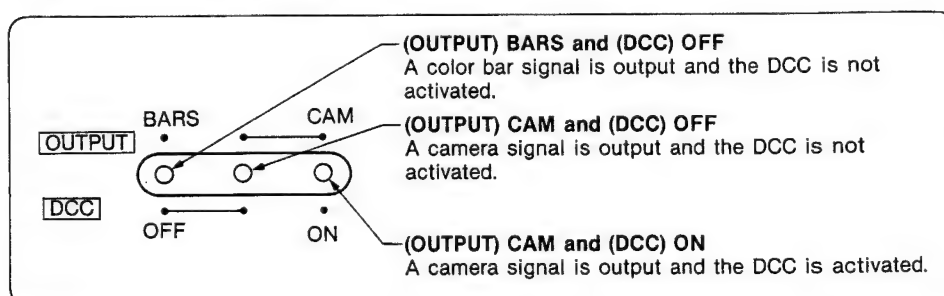
Before operating the camera system, set the selectors as illustrated below.



OUTPUT/DCC (camera output/dynamic contrast control) selector

Use the DCC when:

- You shoot an object in the shade on a clear day.
- You shoot two or more objects, one is inside the room with the video camera and the other is outside the room. For example, the video camera is inside a house and is shooting an object within the room and one outside through a window.
- You shoot a scene which has high contrasts.



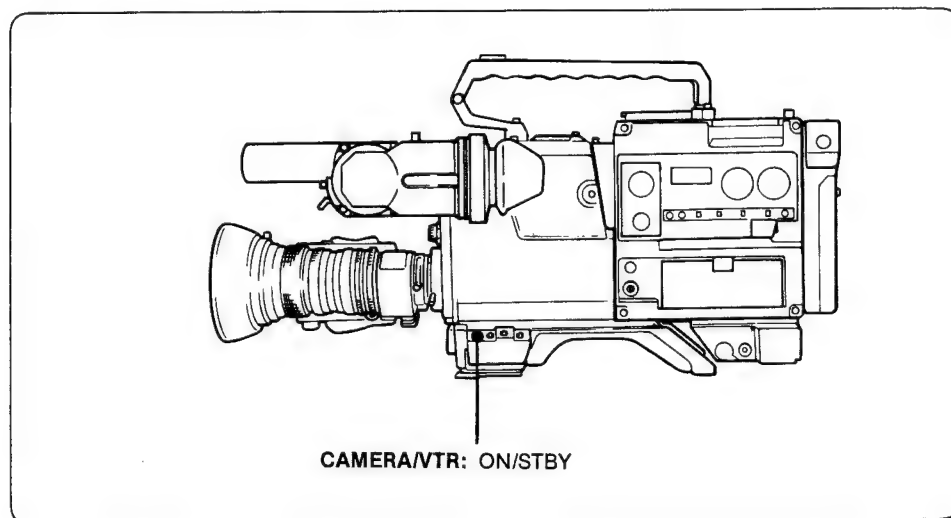
Notes

- If the OUTPUT/DCC selector is set to the BARS and DCC OFF position, the iris will close automatically regardless of whether or not the iris control is set to automatic or manual. However, if the iris control is set to manual, the iris will not reopen automatically. Once you are ready to shoot again, you must open it by hand.
- When the video camera is used with a Betacam VCR, the I and Q signals in the color bars will be replaced by black.
- The selector should also be set to the BARS and DCC OFF position to change the on-screen display mode of the viewfinder using the AUTO W/B BAL switch.

Procedure

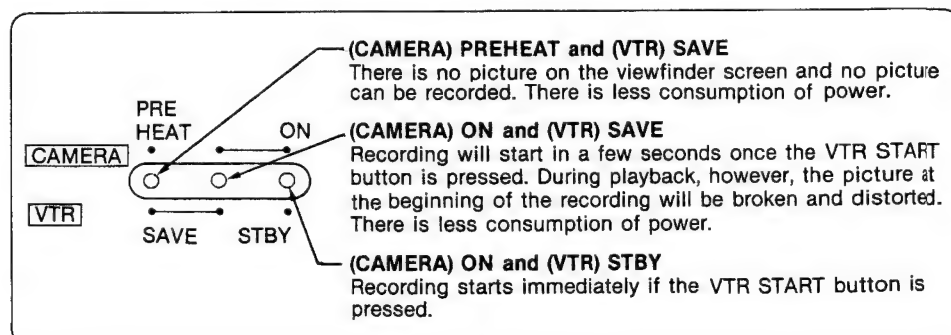
Proceed as follows:

- 1 Turn on the video camera and the attached VCR.



CAMERA/VTR power switch

Used to control the power supply to the video camera and the VCR.



Note

- If the CAMERA/VCR power switch is set to the (CAMERA) PREHEAT and (VTR) SAVE position, the iris will close automatically regardless of whether or not the iris control is set to automatic or manual. However, if the iris control is set to manual, the iris will not reopen automatically. Once you are ready to shoot again, you must open it by hand.

- 2 Insert a cassette tape into the VCR.
- 3 Select the filter which is appropriate for the light source being used.

- 4** Set the black set/black balance and the white balance.
See the "Checking functions and adjusting color balance" section on page 50 if you need to make adjustments.

If the values for the black and white balances have already been stored in memory:

Set the WHITE BAL selector to the A or B memory position which is appropriate.

If neither the black nor white balance values have been stored

Adjust the black balance first following the automatic black set/black balance adjustment procedure on page 52. Once the black balance has been adjusted, set the white balance value by using either the factory-preset 3200 K white value (remember that the FILTER selector must be set to the 1 position. For 5600 K, set it to the 3 position) or by following the automatic white balance adjustment procedure on page 54.

- 5** Shoot a subject while adjusting the focus and the zoom.
- 6** Press the VTR START button and start recording.
The REC lamp in the viewfinder will be lit during recording.
If any lamp in the viewfinder blinks, see the "Operation Warnings" section on page 76.
- 7** To stop recording, press the VTR START button again.

If you want to check the video level while manually adjusting the iris

Set the ZEBRA switch to the ON position and look at the viewfinder screen. The zebra pattern will appear in the portion of the picture which has a video level of 70% (in the IRE scale unit) so that you can set the iris easily. When you have adjusted the iris, turn the ZEBRA switch back to the OFF position.

If the video output level is too low and the picture is too dim

The viewfinder screen will display "LOW LIGHT" and the colon on the left of the display will blink. Check to see if the iris is open fully, and if so, increase the gain by setting the GAIN selector to either the 9 dB or 18 dB position. If the illumination is still not sufficient, it can be increased to 24 dB by using the switch inside the video camera. See the maintenance manual for more details. Once the illumination is sufficient, be sure to set the GAIN selector to the 0 position.

Specifications and Characteristics

Main unit

Optical characteristics

Imager	2/3 inch (Interline Transfer) 3 chip CCD
Imager configuration	RGB 3-CCDs
Spectral system	F1.4 prism system (with quartz filter)
Built-in filters	1: 3200 K 2: 5600 K and 1/4 ND 3: 5600 K 4: 5600 K and 1/16 ND
Electronic shutter	6 speeds: 1/100, 1/125, 1/250, 1/500, 1/1000, and 1/2000 sec.
Lens mount	Special bayonet type

Electrical characteristics

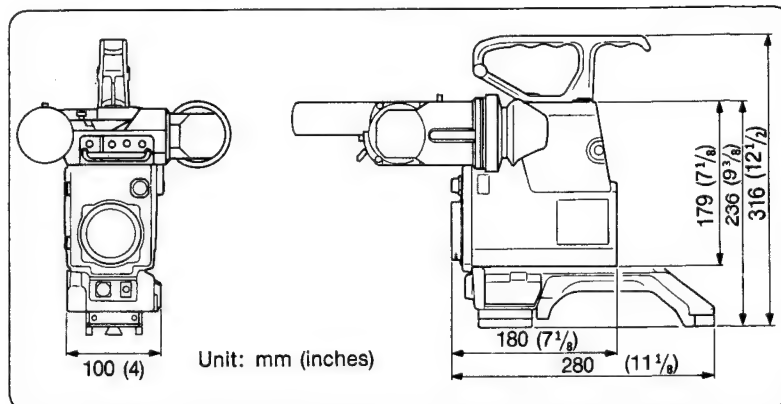
Video output	NTSC, 1.0 Vp-p, 75 ohms, unbalanced, sync negative (with two outputs: TEST OUT and VTR connectors)
I/O connectors	VTR (50-pin): video output, microphone output, sync output, power input TEST OUT (BNC type) LENS (12-pin) REMOTE (6-pin) VF (20-pin)
Sensitivity	2000 lux (F5.6 typical when the electronic shutter is off), 89.9% reflection 2000 lux (F4.0 typical with the shutter speed set at 1/125)
Minimum illumination	15 lux (F1.4 with +18 dB gain setting)
Video signal-to-noise ratio	62 dB (typical)
Horizontal resolution	700 TV lines or more (at center)
Registration	0.05% or less on entire screen (without lens)
Geometric distortion	Not identified
Smear	0.004% (Y ch typical)
Power voltage	12 V dc (10.5 V to 17 V)
Power consumption	13 W

Environmental characteristics

Operating temperature	-20°C to +45°C (-4°F to +113°F)
Storage temperature	-20°C to +60°C (-4°F to +140°F)

Physical characteristics

Weight 3.4 kg (7 lb 5 oz) with viewfinder
Dimensions See the illustrations below.



Viewfinder

Picture tube 1.5 inch monochrome
Horizontal resolution 550 TV lines
Microphone Sharp-directional type

Supplied accessories

Tripod attachment (VCT-14) (1)
Extension board (1)
Mounted board extractor (1)
2.5 mm dia. Allen key (1)
3.0 mm dia. Allen key (1)
50-pin VTR connector cap (1)
Rain cover (1)
Screw hole cover (1)
Protective screws (2)
Microphone connector cover (1)
Chest pad (1)
Operation manual (1)
Maintenance manual (1)

Options

BVV-5/BVV-1A Betacam on-board VCR
CA-3A camera adaptor
CA-50 camera adaptor
AC-500 ac power adaptor
C-74 microphone
CAC-11A microphone holder
CRS-3N microphone suspension
Tripod attachment (VCT-13)
LC-555 carrying case
LC-303 SFT soft case
Camera cables: CCZQ-2 (2 m), CCZQ-5 (5 m), CCZQ-10 (10 m), CCZ-2 (2 m), CCZ-10 (10 m)

Design and specifications are subject to change without notice.

Using the BVW-507 Betacam System

Outline of the BVW-507 (BVP-7 and BVV-5) Betacam system

Features

Compact and lightweight

The BVW-507 Betacam system is composed of the BVP-7 video camera, BVV-5 Betacam VCR and their accessories. The combined weight of the video camera and the VCR is only 9.15 kg.

Cableless system

The BVP-7, BVV-5 and battery pack(s) can be combined as a Betacam system without using connection cables.

Low power consumption

An NP-1 battery can operate the Betacam system for about 40 minutes when it is operated within the specified temperature range.

Video and audio recording confidence function

This function allows you to check video and/or audio signals that have been recorded during recording.

High quality picture

The recording format, which uses a 1/2-inch cassette tape, produces a high quality picture.

A built-in time code generator

A time code can be recorded using the built-in time code generator. User bit data can also be recorded.

Time code signal track

The time code is not recorded on the video track, but on a track of its own. This means that the time code can be recorded or erased using an editing control unit without affecting the video. Scenes can be composed shot-by-shot without causing a break-up in the picture because the system automatically connects the frames.

Warning system

When something is about to occur within the system which requires your attention, for example the tape is about to run out, a warning lamp will light and an alarm will be heard in the earphone.

Remaining tape time indicators


There are two lamps which indicate that you are running low on tape. The 1st lamp in the viewfinder will light up ten minutes before the tape will end and the 2nd lamp will light five minutes before the tape ends.

Wireless microphone system

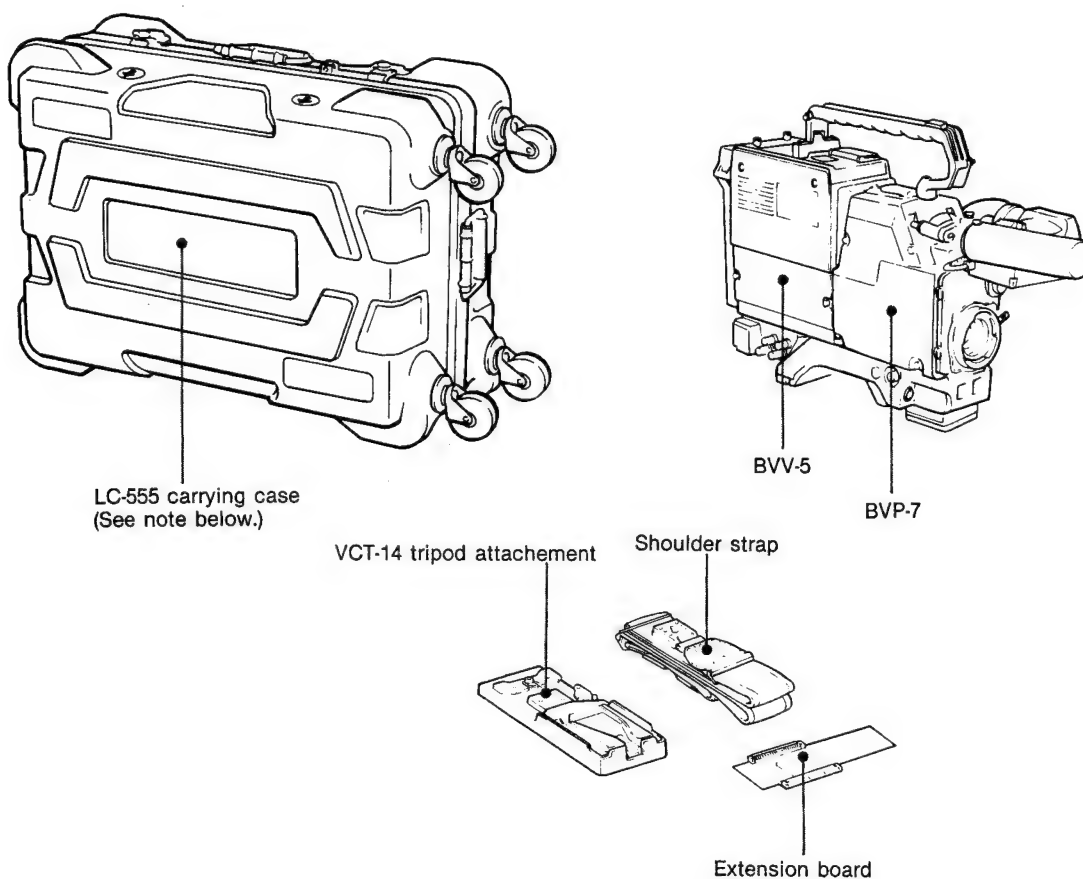
A unit receiving signals from the wireless microphone can be attached to the Betacam system.

Dolby NR* (Noise Reduction) C system

The Dolby NR C system is employed to improve the audio signal-to-noise ratio and dynamic range.

*Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "DOLBY" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

System configuration



Supplied accessories:

- Rain cover (1)
- Chest pad (1)
- Screws used to protect the screw holes (2)
- Board extractor (1)
- Caps for 50-pin VTR connectors (2)
- Allen (L-shaped) key (3 mm in dia.) (1)
- Microphone connector cover (1)
- BVP-7 operation manual (1)
- BVP-7 maintenance manual (1)
- BVV-5 operation manual (1)
- BVV-5 maintenance manual (2)
- LC-555 instruction manual (1)

Note

- Although a carrying case is supplied with the complete BVW-507 Betacam system, the carrying case will not be supplied if the BVP-7 and BVV-5 are purchased separately.

Testing the system before shooting

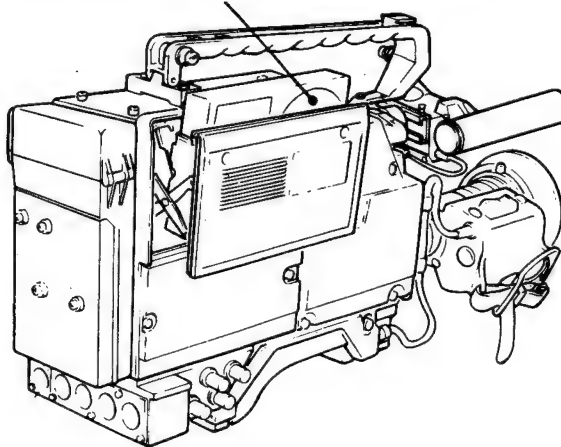
Preparation for testing

Before operating the Betacam system, test the system functions using a color monitor.

Proceed as follows:

- 1** Install a fully-charged battery and set the POWER switch on the VCR to the ON position.
- 2** Check to be sure that the HUMID lamp is not lit and that the voltage of the battery is sufficient for operation.
Press the BATT CHECK button. The pointer of the meter should move to a position within the green zone.
- 3** Slide a cassette tape into the compartment, then push the holder back into place (towards the body of the VCR). Be sure the cassette window faces outward as illustrated.

The cassette window should be positioned on this side.

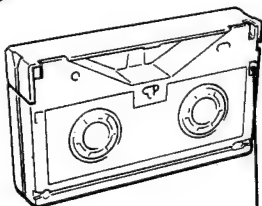


Before recording be sure that the safety tab or the safety plug at the bottom of the cassette case is in its correct position.

- 4** Go on to the "Testing the video camera" section.

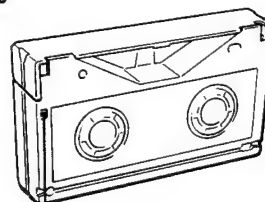
To avoid erasing a previous recording, do as follows:

Metal tape



Push the plug.
To re-record, set the
plug in the original
position.

Oxide tape

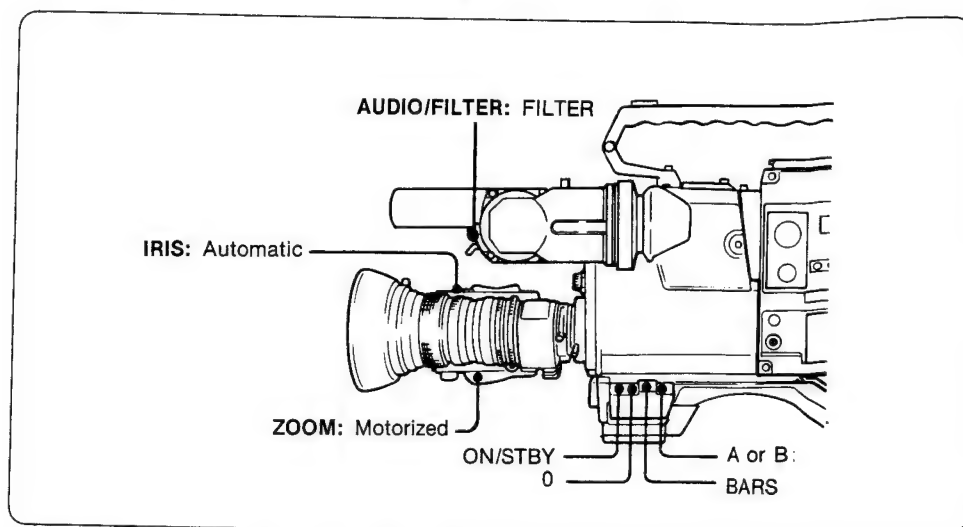


Break out the tab.
To re-record, cover the slot
with a piece of plastic tape.

Testing the video camera

Proceed as follows:

- 1 Set the selectors as illustrated below.



- 2 Adjust the position of the viewfinder.
- 3 Check that the color bars appear on the viewfinder screen. Turn the BRIGHT and CONTRAST controls, located on the front of the viewfinder, so that the color bars on the viewfinder screen become clear.
- 4 Set the OUTPUT/DCC selector to the BARS position, and then push the AUTO W/B switch up to the WHT position several times and check to see if the on-screen display mode number on the viewfinder screen changes.
- 5 Switch the FILTER selector to the 1, 2, 3 and 4 positions in that order. Check to be sure that the lamp which corresponds to the number of the filter being used lights up in the viewfinder.
- 6 Switch the OUTPUT/DCC selector to the CAM position and then shoot a subject. Adjust the focus by turning the focus ring. Check to be sure that the picture appears on the viewfinder screen.
- 7 Press the zoom switch located on the lens unit. Check that the zoom function changes automatically from wide to telephoto and back again.
- 8 Set the zoom control to manual and then turn the zoom ring on the lens. Check to be sure that the zoom function can be manually changed from wide to telephoto and back again.
- 9 Switch the zoom control back to automatic (motorized). Shoot first one subject, then another in two different lighting conditions. While shooting, check that the automatic iris control functions properly.
- 10 Set the iris control to manual and then check the manual iris control function by manually turning the iris ring.
- 11 Press and hold down the instant auto iris button on the lens unit to temporarily activate the automatic iris control. Shoot one subject then another with different brightness levels. While shooting, check that the iris ring is turning.

- 12 Set the iris control back to automatic and then switch the GAIN selector first to the 9 and then to the 18 position while shooting a subject. Check that the iris closes more as the gain increases, and that the GAIN UP indicator in the viewfinder lights.
- 13 Set the GAIN selector back to the 0 position and the AUDIO/FILTER switch to the AUDIO position. Check that the FILTER/AUDIO indicator in the viewfinder indicates the audio level.
- 14 Go on to the "Testing the VCR" section.

Testing the VCR

Although this test consists of six sections, the five sections, beginning with the "Checking tape transportation and related functions" section and ending with the "Checking the audio confidence function" section, must be checked in the order given below.

Checking tape transportation and related functions

- 1 Set the F-RUN/R-RUN switch to the R-RUN position.
- 2 Set the DISPLAY switch to the CTL position.
- 3 Press the VTR START button located on the video camera and then check that:
 - The cassette tape reels rotate.
 - The figures on the display change as the tape winds.
 - The REC lamp in the viewfinder lights up.
 - The RF and SERVO indicators on the display do not light up.
- 4 Press the VTR START button again. The tape should stop winding and the REC lamp in the viewfinder should go out.
- 5 Press the VTR button, located on the lens unit, and then check the same items listed in step 3 again.
- 6 Press the VTR button again. The tape should stop winding and the REC lamp in the viewfinder should go out.
- 7 Press the PRESET button. The figures on the display should now be reset to "00:00:00:00".
- 8 Set the LIGHT switch to the ON position. The display window and the level meters should be illuminated.

Checking the automatic audio recording level control on channels 1 and 2

- 1 Set both the AUDIO SELECT CH-1/CH-2 switches to their AUTO positions.
- 2 Set both the AUDIO IN CH-1/CH-2 switches to their CAM positions.
- 3 Set the MONITOR SELECT LNG/AFM switch to the LNG position.
- 4 Point the microphone towards a sound source. The pointers on both the level meters should indicate that sound is being picked up.

Checking the audio-recording-level-control on each channel

- 1 Set the AUDIO IN CH-1/CH-2/CH-3/CH-4 switches to their CAM positions.
- 2 Set the AUDIO SELECT CH-1/CH-2 switches to their MAN positions.
- 3 Turn the AUDIO LEVEL CH-1/CH-2 controls clockwise. The pointers on both the level meters should indicate that sound is being picked up.
- 4 Set the MONITOR SELECT LNG/AFM switch to the AFM position.
- 5 Turn the AUDIO LEVEL CH-3/CH-4 controls clockwise. The pointers on both the level meters should indicate that sound is being picked up.

Checking the earphone and loudspeaker

- 1 Set the CAMERA/VTR power switch, located on the video camera, to the VTR/STBY position.
- 2 Set the MONITOR switch to the EE position.
- 3 Turn the LEVEL control clockwise and the volume of the speaker should increase.
- 4 Connect an earphone to the EARPHONE jack. The speaker should be cut out and the output should be switched to the connected earphone.
- 5 Turn the LEVEL control clockwise and the volume in the earphone should increase.

Checking the audio confidence function

- 1 Set the MONITOR switch to the PB position.
- 2 Set the AUDIO IN CH-1 switch to the CAM position and the CH-2 switch to any position other than the CAM position.
- 3 Press the VTR START button located on the video camera. Sound from the microphone should be heard.
- 4 Set the AUDIO IN CH-2 switch to the CAM position and the CH-1 switch to any position other than the CAM position. Sound from the microphone should be heard.

Checking the audio level in externally connected microphones

- 1 Connect the microphones to the AUDIO IN CH-1/CH-2/CH-3/CH-4 connectors.
- 2 Set the AUDIO IN CH-1/CH-2/CH-3/CH-4 switches to their MIC positions.
- 3 Point the externally connected microphones towards a sound source.
- 4 Set the MONITOR SELECT LNG/AFM switch to the LNG position in order to check the levels on CH-1 and CH-2. The pointers of both the level meters should indicate that sound is being picked up.
- 5 Set the MONITOR SELECT LNG/AFM switch to the AFM position in order to check the levels on CH-3 and CH-4. The pointers of both the level meters should indicate that sound is being picked up.

Note

- If only one microphone is available, check the level of each of the four channels by connecting the microphone to the connectors one by one.

Checking the preset time code and user bit data

- 1** Enter user bit data if necessary.
- 2** Set the time code.
- 3** Set the F-RUN/R-RUN switch to the R-RUN position.
- 4** Press the VTR START button located on the video camera. The time code figures on the display should change as the tape travels.
- 5** Press the VTR START button again. The tape should stop and the figures should no longer change on the display.
- 6** Set the F-RUN/R-RUN switch to the F-RUN position. The figures on the display should change.
- 7** Set the DISPLAY switch to the U-BIT position. The user bit data should be displayed.

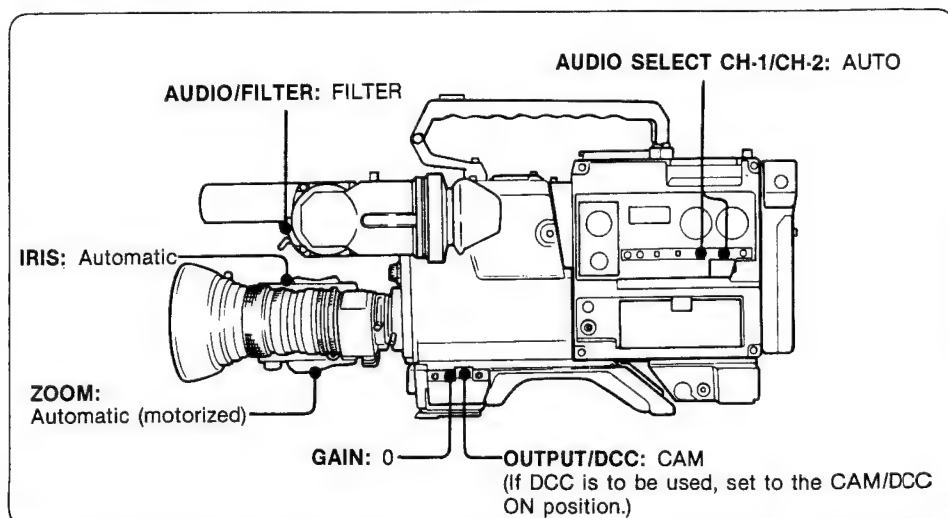
Checking the real time setting

Set the REAL TIME switch to the SET position. The real time will be displayed on the display window regardless of the setting of the DISPLAY switch. While the REAL TIME switch is set to the SET position, the time displayed will not change.

Shooting and recording

Preparation for shooting and recording

Before starting to shoot, set the selectors as illustrated below.



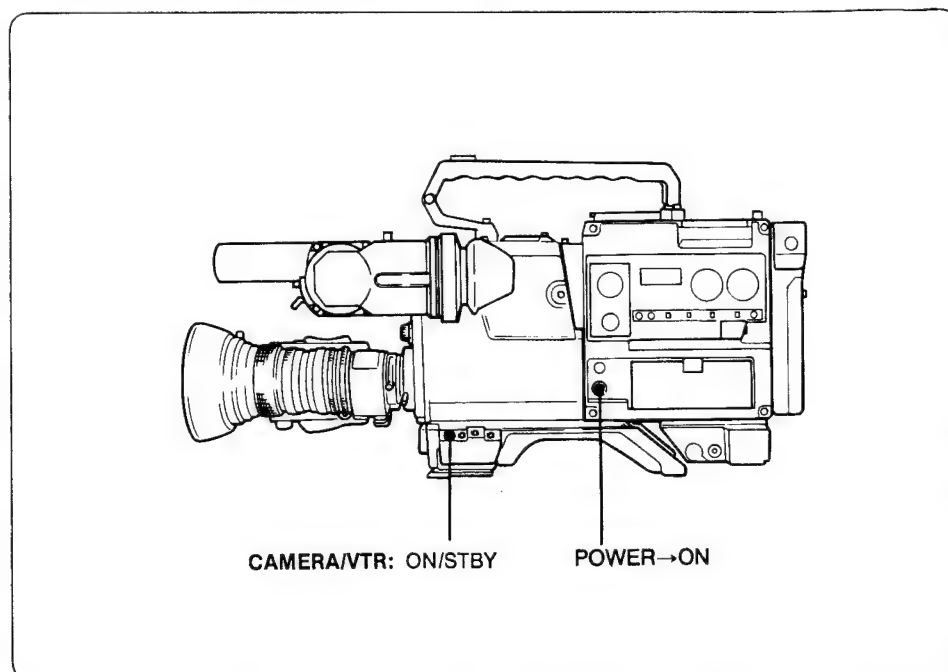
Note

- If you want to manually control the audio recording level, see the "Manual control of audio recording gain from the video camera" section on page 73.

Operating procedure

Proceed as follows:

- 1 Turn on the power as illustrated.



- 2 Slide a cassette tape into the cassette holder then push the holder back into place.

3 Set the FILTER selector to the position which is appropriate for the light source.

4 Adjust the black set/black balance and then the white balance.

If the white balance values have already been stored in memory:

To retrieve the white balance values stored in memory, set the WHITE BAL selector to either the A or B memory position which is appropriate.

If the white balance values have not been stored, and you want to start recording immediately:

Set the WHITE BAL selector to the PRESET position. The preset white balance of 3200 K or 5600 K will be retrieved and used by the video camera.

Note that the FILTER selector must be set to the 1 or 3 position respectively. Be sure that the black set/black balance adjustment has already been made. If not, adjust the black set/black balance first.

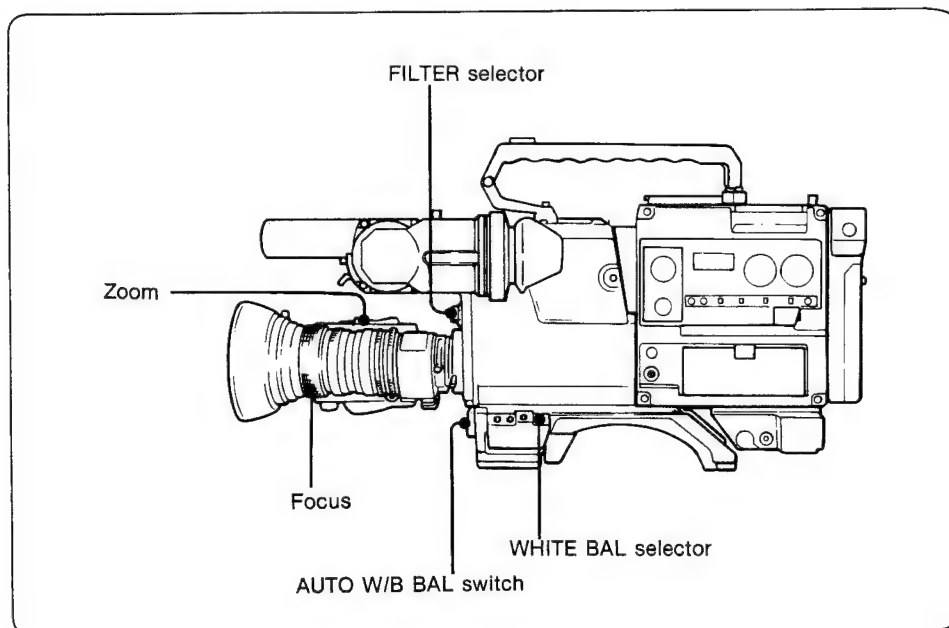
If you want to start recording after adjusting the black set/black balance and the white balance:

- a Set the WHITE BAL selector to either the A or B position.
- b Shoot and zoom in on a white subject.
- c Push the AUTO W/B BAL switch down to the BLK position. When the W/B CENT indicator in the viewfinder lights up and "BLACK:OK" is displayed on the viewfinder screen, the black set/black balance adjustment is finished.
- d Push the AUTO W/B BAL switch up to the WHT position. When the W/B CENT indicator in the viewfinder lights up and "WHITE:OK" is displayed on the viewfinder screen, the white balance adjustment is finished.

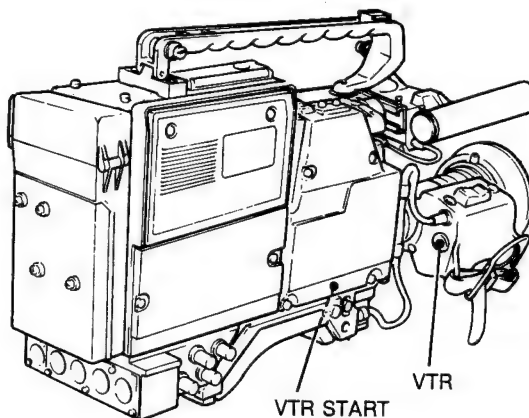
Note

- For more details, see the "Adjusting black set/black balance and white balance" sections on page 52.

5 Shoot a subject and adjust the focus and the zoom.



- 6 Press either the VTR START button located on the video camera or the VTR button located on the lens unit. Recording will begin.



The REC lamp in the viewfinder will be lit during recording.

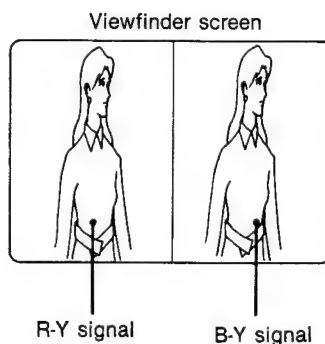
- 7 To stop recording, press either the VTR START button or the VTR button again. The REC lamp will go out and the VCR will go into the standby mode.

Checking the recording of the luminance signal during recording

By pressing and holding down the RET button located on the lens unit, it is possible to check to see if the luminance signal has been recorded. The luminance signal has been recorded if a picture appears on the viewfinder screen. If the MONITOR SELECT LNG/AFM switch, located on the VCR, is set to the LNG position, the audio signal that has just been recorded on CH-1 and CH-2 can also be monitored.

Checking the recording of the chrominance signal during recording

By pressing and holding down both the CTDM PB button on the VCR and the RET button located on the lens unit, it is possible to check to see if the chrominance (color difference) signal has been recorded. The chrominance signal (made up of the R-Y and B-Y signals) has been recorded if a picture, in monochrome, appears on the viewfinder screen.



Reviewing the last recorded scene

Press the RET button on the lens unit after finishing a recording. The last two seconds of the recorded scene will be played back and then the VCR will go into the standby mode. If the RET button is pressed and held, the last ten seconds of the recorded scene can be played back.

Frame-accurate backspace editing

When you start and stop recording again and again, frame-accurate backspace editing can be automatically made as long as the cassette is being loaded and the CAMERA/VTR power switch on the video camera is being set to the (VTR) STBY position. Frame-accurate backspace editing can also be performed even when the CAMERA/VTR power switch is set to the (VTR) SAVE position. However, it takes about three seconds longer to start recording than when the CAMERA/VTR power switch is set to the (VTR) STBY position.

If you want to start frame-accurate backspace editing when:

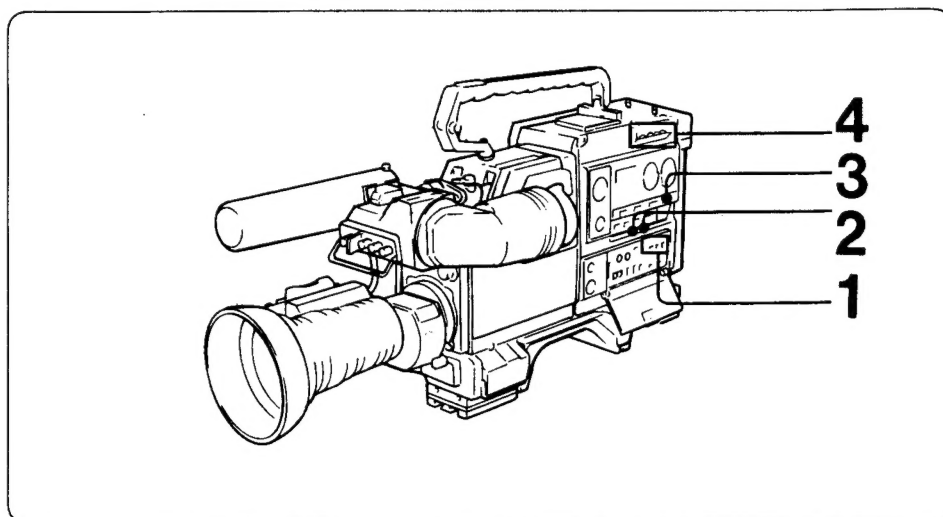
- The Betacam system has been turned off once and turned on again.
- The cassette has been ejected once and re-inserted.
- A recorded tape will be used to make editing on the recorded material.

- 1** Search to the point where you want to start editing the tape by monitoring the viewfinder screen. Press the STOP button. The tape will stop within three seconds after the STOP button is pressed.
- 2** Press the RET button on the lens unit, and the tape will move to the point which you have just chosen as the place to start editing.
- 3** Press either the VTR button on the lens unit or the VTR START button on the video camera. Editing will begin.

Audio recording

To automatically control the audio recording gain on channels 1 and 2, set the AUDIO SELECT CH-1 and CH-2 switches to their AUTO positions.

To manually control the audio recording gain on channels 1 and 2, or to control the audio recording gain on channels 3 and 4, proceed as follows:

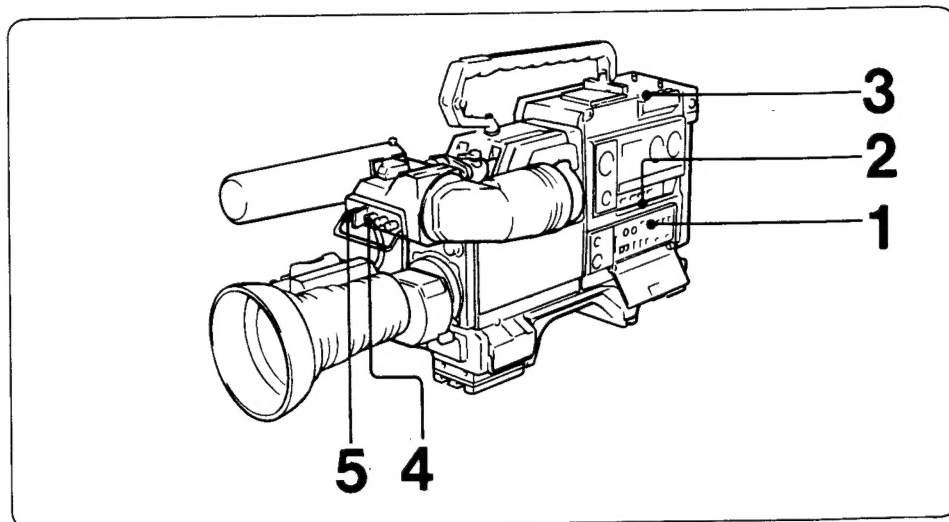


- 1** Set the AUDIO IN CH-1/CH-2/CH-3/CH-4 switches as follows:
 - When using the supplied microphone, set to: CAM
 - When using externally connected microphones, set to: MIC
 - When using other audio equipment, set to: LINE
- 2** To adjust the level on audio channels 1 and 2, set the AUDIO SELECT CH-1 and CH-2 switches to their MAN positions.
- 3** To adjust the level, set the MONITOR SELECT LNG/AFM switch as follows:
 - To adjust audio channels 1 and 2, set to: LNG
 - To adjust audio channels 3 and 4, set to: AFM
- 4** Turn the AUDIO LEVEL CH-1/CH-2/CH-3/CH-4 controls so that the meters read 0 VU at maximum levels.

Manual control of audio recording gain from the video camera

The audio recording gain on CH-1 can be manually controlled by the AUDIO LEVEL CH-1 control located on the viewfinder.

Proceed as follows:



- 1** Set the AUDIO IN CH-1 switch located on the VCR as follows:
 - When using a microphone connected to the video camera, set to: CAM
 - When using a microphone connected to the VCR, set to: MIC
 - When using another audio equipment, set to: LINE
- 2** Set the AUDIO SELECT CH-1 switch to the MAN position.
- 3** Turn the AUDIO LEVEL CH-1 control on the VCR clockwise as far as it will go.
- 4** Set the AUDIO/FILTER selector, located on the viewfinder, to the AUDIO position.
- 5** Turn the AUDIO LEVEL CH-1 control, located on the viewfinder, clockwise until the FILTER/AUDIO indicators (1 through 4) in the viewfinder are lit. The red indicators, which are activated when the incoming audio level is very high, should also come on occasionally.

Notes

- The AUDIO LEVEL CH-1 control can control audio gains up to 20 dB. If the recording level is still too high after adjusting the level with this control, use the AUDIO LEVEL CH-1 control on the VCR to lower it.
- The FILTER/AUDIO indicator in the viewfinder indicates peak levels. When a sine wave is input and its level is at 0 VU on the meter of the VCR, the FILTER/AUDIO indicator will indicate 3. However, when an audio signal other than a sine wave is input, and its level is also at 0 VU on the meter of the VCR, the FILTER/AUDIO indicator will indicate 4. The level indication in the viewfinder corresponds to the meter indication on the VCR as follows:

FILTER/AUDIO indicator	1	2	3	4	
Level meter indication of a sine wave.	-6	-4	0+3+6	(VU)	

Playback

The picture being played back can be monitored on the viewfinder screen although it is displayed in monochrome. The picture can also be monitored on a television monitor connected to the PB ADAPTOR of the VCR. See the operation manual supplied with the VCR for more details.

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The level of the alarm can be adjusted with the volume control on the VCR. To adjust the level without affecting the other audio levels, see the maintenance manual of the VCR. To cut off the alarm sound only, set the ALARM switch to the OFF position.

* Only during recording. ** Only during playback, fast forward or rewind

Symbols

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